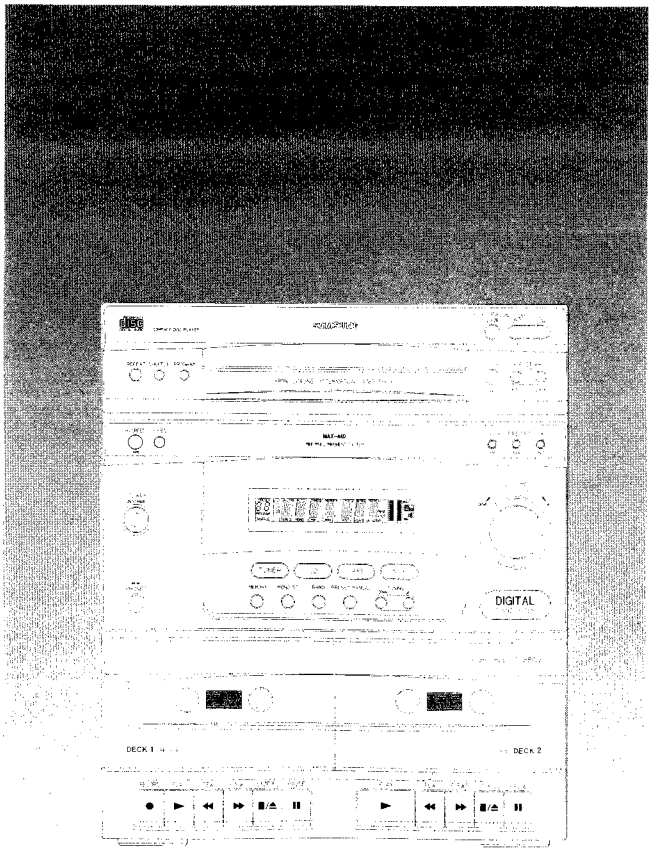
SAMSUNG

MINI COMPONENT SYSTEM

MAX-440

SERVICE Manual

MINI COMPONENT SYSTEM



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* Design and specification are subject to change upon improvement without prior notice.

1. Safety precaution

1-1. Class 1 laser product

This laser disc player is classified as a CLASS 1 laser product.

1-2. Laser warning label

The label shown below may be affixed or not according to country.

(UL)

This Product Complies with DHHS Rules 21CFR, Sub chapter J.At date of Manufacture

(CSA)

CERTIFIED ONLY TO CANADIAN ELECTRICAL CODE.

CERTIFIE EN VERTU DU CODE CANADIAN DE LELETRICITE SEULEMENT

(EU)

CLASS 1
LASER PRODUCT

Location: Enclosure back.

(SCAN)

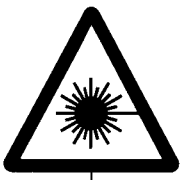
CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATEO AVOIDEXPOSURE TO BEAM

ADVARSEL: USYNLIG LASERSTRÅLING VED ABNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGA UDSAETTELSE FOR STRALING

VARO:AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTINA NAKYMATTÖMALLE LASERSATEILYLLE ALA KATSO SATEESEEN!

VARNING:OSYNLIG LASERSTRÅLNING NAR DENNA DEL AR OPPNAD OCH SPARREN AR URKOPPLAD BETRAKTA EJSTRÅLEN!

(EU)



UL	: Manufactured for U.S.A. Market.
CSA	: Manufactured for Canadian Market.
EU	: Manufactured for European Market.
SCAN	: Manufactured for Scandinavian Market.

Location : on the disc clamper or inner side of UNIT door or nearby UNIT chassis.

1-3. Laser beam warning

ADVERSEL –Usynlig saserstråling ved åbning, når Sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

VARNING –Osylig laserstralning när denna del är öppnad och spärr är urkopplad. Stralen är farlig.

VARITUS –Laite sisältää laserdiodin, joka lähettää näkymätönta silmille vaarallista lasersateilyä.

CAUTION –Invisible laser radiation when door is open and interlocks defeate. Avoid exposure to beam.

1-4. Laser diode specification (Optical pick-up)

- Material : GaAs+GaAlAs
- Wavelength : 760-800nm
- Emission duration : Continuous
- Laser Output : 0.2mW
  * This output is the value measured at distance 1.6mm from the objective lens surface on the optical pick-up block.
- Classification : CLASS 1

1-5. Warning for servicing

WARNING: When servicing, do not approach the LASER exit with the eye too closely. In case it is necessary to confirm LASER beam emission, be sure to observe from a distance of more than 30cm from the surface of the objective lens on the optical pick-up block.

VARNING: När underhållningsarbeten utförs, närma dig försiktigt och se inte på laserutstrålningen på för nära häll. If all det är nödvändigt att betrygga laserstrålens utströmning. Var säker att kontrollera detta från ett avstående av mer än 30cm (11.81 inch.) fråan den objektiva linsens yta på den optiska utsåndningspunkten.

ADVARSEL: När repareringsarbejdet udfoeres, naerm dig forsigtigt og se ikke på laserudstrålingen påa for naer håand. ^t ilfaeldet at det er noedvaendigt at bestemme laserstrålens udstråling. Vaer sikker på kontrollere dette fra en afstand af mere end 30cm (11.81 inch.) fra den objektive linses overflade på den optiske udsendningspunkt.

VAROITUS: Silmiä on varottava viemästä liian läbeile laser-poistokanavaa huoiion aikana. Jos on välttämätöntä varmistaa Laser-Säteen päästö, pysyttels sitä tarkasteltaessa vähintään 30cm etäiyydellä optisen lukon objecktiivilinssin pinnasta..

1-1-6. Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

(1) Be sure that no built-in protective devices are defective or have been defeated during servicing. (1) Protective shields are provided to protect both the technician and the customer. Correctly replace all missing protective shields, including any remove for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/ capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.

(2) Be sure that there are no cabinet openings throught which adults or children might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, excessively wide cabinet ventilation slots, and an improperly fitted and/or incorrectly secured cabinet back cover.

(3) Leakage Current Hot Check-With the instrume-nt completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use a isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1270 (40.7). With the instrument's AC switch first in the ON positin and then in the OFF position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinets, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis.

Any current measured must not exceed 0.5 millamp. Reverse the instrument power cord plug in the outlet and repeat the test.

See Figure 1.

Any measurements not within the limits specified herein indicate a potential shock hazard that must be ellminated before returning the instrument to the customer.

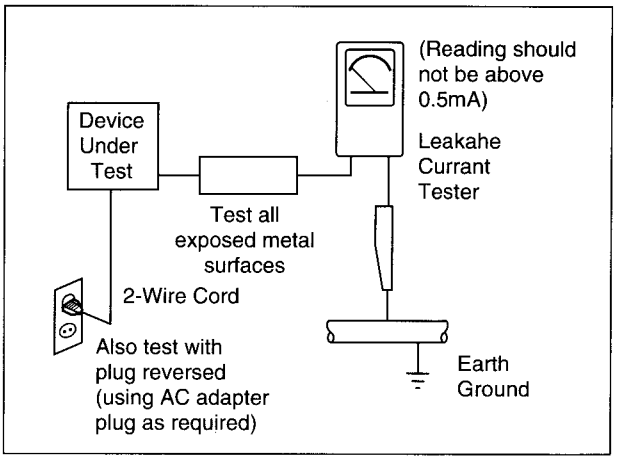

(Reading should not be above 0.5mA)
Leakahe Currant Tester
Device Under Test
Test all exposed metal surfaces
2-Wire Cord
Also test with plug reversed (using AC adapter plug as required)
Earth Ground

FIG. 1 AC Leakage Test

(4) Insulation Resistance Test Cold Check-(1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug. (2) Turn on the power switch of the instrument. (3) Measure the resistance with an ohmmeter between the jumpered AC plug and all exposed metallic cabinet parts on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. When an exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 megohm. When there is no return path to the chassis, the reading must be infinite. If the reading is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repared and rechecked before it is returned to the customer.

See Figure 2.

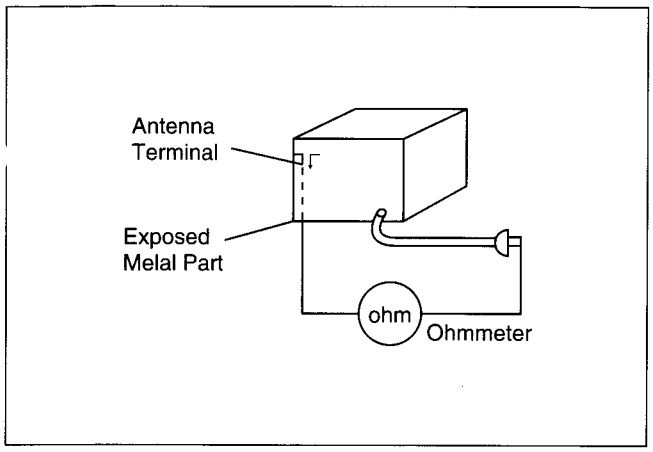


FIG. 2 Insulation Resistance Test

1-1-7. Read and comply with all caution and safety-related notes non or inside the cabinet, or on the chassis.

1-1-8. Design Afteration Warning-Do not alter or add to the mechanical or electrical design of this instrument. Design alterations and additions, including but not limited to, circuit modifications and the addition of items such as auxiliary audio output connections, might alter the safety characteristics of this instrument and create a hazard to the user. Any design alterations or additions will make you, the servicer, responsible for personal injury or property damage resulting therefrom.

1-1-9. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: (1) near sharp edges, (2) near thermally hot parts (be sure that leads and components do not touch thermally hot parts), (3) the AC supply, (4) high voltage, and (5) antenna wiring. Always inspect in all areas for pinched, out-of-place, or frayed wiring. Do not change spacing between a component and the printed-circuit board. Check the AC power cord for damage.

1-1-10. Components, parts, and/or wiring that appear to have overheated or that are otherwise damaged should be replaced with components, parts and/or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

1-1-11. Product Safety Notice-Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by shading, an (*) or a ( ) on schematisc and parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might created shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

2-3. ESD, Precautions

Electrostatically SensitiveDevices (ESD)

Some semiconductor (solid state) devices can be damaged easily by static electricity.
Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

(1) Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic aharge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

(2) After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

(3) Use only a grounded-tip soldering iron to solder or unsolder ESD devices.

(4) Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESD devices.

(5) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damge ESD devices.

(6) Do not remove a replacement ESD device from its protective package until immediately before your are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).

(7) Immediately before removing the protective materials from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

(8) Minimize bodily motions when handling unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

3. Chip replacement

3-1. Precaution for the Chip Replacement

(1) Do not touch the part body directly with the soldering iron. ICS, especially TSOP, are easily damaged by heat.
(2) Use care regarding soldering iron tip and avoid rapidly heating parts. Some parts can be damaged by sudden heating. Preheat the part at about 100°C for several minutes before installing it.
(3) Use soldering tip temperature of about 240°C or larger parts, use a slightly higher temperature (about 280°C).
(4) The thin (0.3mm) solder for miniature parts does not contain adequate flux. Supplementary flux is thus needed in most cases.

The NoteMaster 486S/25N series systems are manufactured using flux which can be cleaned by water in the factory. When your replace the part or troubleshooting, use proper flux and solder which can be cleaned by water. Soldering area will corrode, if proper flux and solder are not used in replace. And it may cause a fatal error to the system.

(5) Use care not to damage the circuit pattern, especially when removing.
(6) Because of the many pins, cleanliness of the pattern is extremely important after removing the IC.
(7) Use care to avoid solder bridges. Remove any that occurs.
(8) Position the part carefully. This will also affect the soldering operation. Be very precise in positioning the IC. Soldering opposite pins first holds the IC in place and makes soldering the other pins easier.
(9) Do not reuse removed parts.
(10) Check for solder joints, especially miniature parts with small lead.
(11) A defective trimming resistor cannot be adjusted externally. Replace with an ordinary variable resistor.
(12) It is important to inspect the work with a magnifier. Check after installing (cold solder joints, etc).

3-2. Tools for the Chip Replacement

The tools for the chip replacement are as follows:

(1) Thin tip type soldering iron
(2) Small flat-blade tip type soldering iron
(3) Special desoldering tip iron
(4) Airblower unit
(5) Flat Package Pick-up
(6) Flux can be cleaned by water
(7) 0.3mm thin solder can be cleaned by water
(8) Desoldering wire
(9) Tweezers

3-3. Chip Resistors and Chip Capacitors

3-3-1. Kind jof the Part

The kind of chip resistors and chip capacitors as follows

(1) Thick Film Chip Resistors
(2) Carbon Film Chip Resistors
(3) Metal Film Chip Resistors
(4) Chip Ceramic Capacitors
(5) Chip Trimming Resistors

3-3-2. Removing the Part

The kind of chip resistors and chip capacitors as follows

(1) Using two soldering irons:
① Use thin tip soldering irons.
② Use soldering tip temperature of about 280°C
③ Simultaneously heat both ends of the part.
④ While heating, grasp the part with the tips of the soldering irons and remove it.
⑤ Use desoldering wire to completely remove the old solder from the part location of the board.
⑥ A clean pattern for installing the new part is very important.

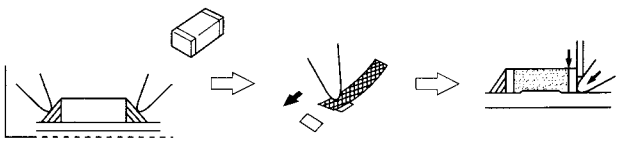


FIG. 4

3-3-3. Installing the Part

(1) Clean the area where the new part is to be mounted.
(2) Apply flux.
(3) Set part correctly into position, prevent it from shifting.
(4) Bring the soldering iron tip close to the part contact without actually touching it. Melt thin (0.3mm) solder between the tip and part so that it flows into the part contact.
(5) Check work quality with a magnifier.

3-4. Chip Tantalum Capacitors and Chip Filters

3-4-1. Kind of the Part

The kind of chip tantalum capacitors and chip filters are as follows:

(1) Chip Inductors
(2) Chip Tantalum Capacitors
(3) Chip Tantalum Electrolytic Capacitors
(4) Chip Aluminum Electrolytic Capacitors
(5) Chip Transformers
(6) Chip Filters

3-4-2. Removing the Part

(1) Using special desoldering iron:
① Select soldering tip according to part size.
② Bring the tip into contact with the soldered points.
③ When the solder melts, remove the part.
④Remove the old solder with desoldering wire.

(1) Using two soldering irons:
① Use small flat-blade tips.
② Heat both ends of the part simultaneously.
③ When the solder melts, grasp and remove the part with the soldering iron tips.
④ Remove the old solder with desoldering wire.

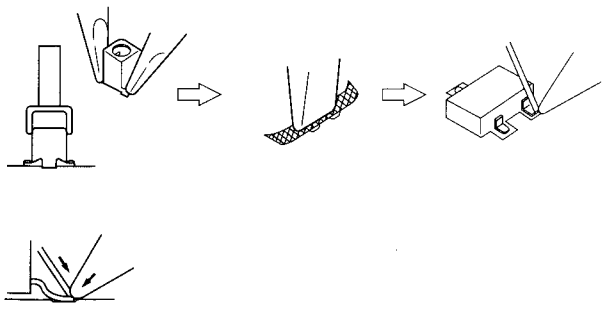


FIG. 5

3-4-3. Installing the Part

(1) Clean the area where the new part is to be mounted.
(2) Apply flux
(3) In part correctly into position, prevent it from shifting.
(4) Use sharp soldering iron tip. Bring close to the part contact without actually touching it. Melt thin solder between the tip and part so that if flows into the part contact.
(5) Check work quality with a magnifier.

3-5. Chip VRs, Chip Trimmer Capacitors, Diodes and Tr.

3-5-1. Kind of the Part

The kind of the part is as follows:

(1) Chip VRs
(2) Chip Trimmer Capacitors
(3) Diode
(4) Transistors

3-5-2. Removing the Part

(1) Using two soldering irons:
① Use small flat-blade tips.
② Heat the leads of the part simultaneously.
③ When the solder melts, grasp and remove the part with the soldering iron tips.
④ Remove the old solder with desoldering wire.

3-5-3. Installing the Part

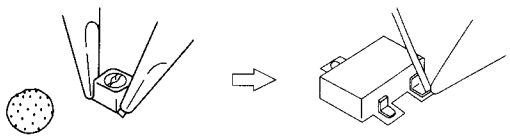


FIG. 6

(1) Clean the area where the new part is to be mounted.
(2) Apply flux
(3) Set part correctly into position, prevent it from shifting.
(4) Use sharp soldering iron tip. Bring close to the part contact without actually touching it. Melt thin solder between the tip and part so that it flows into the part contact.

3-6. Chip ICs

3-6-1. The kind of the Chip ICs

The kind of the chip ICs are as follows:

(1) SOP (Small Outline Package) IC
(2) SSOP (Shrink Small Outline Package) IC
(3) VSOP (Very Small Outline Package) IC
(4) QFP (Quad Flat Package) IC
(5) VQFP (Very Quad Flat Package) IC
(6) PLCC (Plastic Leaded Chip Carrier) IC
(7) TSOP (Thin Small Outline Package) IC

3-6-2. Removing the Part

(1) Using special desoldering iron:
① Select the tip according to the size and shape of the IC.
② Thin" the tip with a small amount of the IC leads.
③ Set the tip squarely over the IC leads.
④ When the solder melts, carefully twist the iron.
⑤ Raise and remove the IC.

(2) Using shaped airblower unit:
① Select the correct nozzle.
② Select the temperature and airblow (suggested: temperature: 7, airblow: 4)
③ Engage the IC removing tool.
④ Use the airblow to preheat the IC for about 5 seconds, then heat with the nozzle until the IC remover lifts the part from the board.

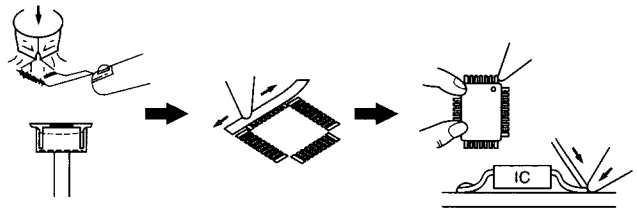


FIG. 7

3-6-3. Installing the Part

(1) Use desoldering wire to remove the previous older.
(2) Clean the location.
(3) Apply flux.
(4) Position the IC and solder two pins at opposite sides.
(5) Use a sharp tipped soldering iron and carefully solder each pin. (After graining experience, a thicke tip can be used for better work efficiency.)
(6) Remove any solder bridges with desoldering wire.
(7) Inspect the work with a magnifier.

2. Specification

2-1. General section

2-1-1. Power source ····· 230V 50Hz
2-1-2. Power consumption ····· 90W
2-1-3. Dimension ····· 270(W)X256(D)X315(H)

2-2. Amp section

2-2-1. Power output ····· 20W(D.T 10%)
15W(D.T 1%)
2-2-2. Frequency response ····· 20Hz~20kHz(±3 dB)
2-2-3. Signal to noise ratio ····· 75 dB
2-2-4. Separation ····· 50 dB

2-3. Radio section

2-3-1. FM section

(1) Frequency range ····· 87.5MHz~108MHz
(2) Usable sensitivity ····· 6μV
(3) Signal to noise ratio ····· 55 dB
(4) Separation(STEREO) ····· 30 dB

2-3-2. MW section

(1) Frequecny range ····· 522~1611kHz
(2) Signal to noise ratio ····· 40 dB
(3) Usable sensitivity ····· 600μV

2-3-3. LW section(Option)

(1) Frequecny range ····· 146~290kHz
(2) Signal to noise ratio ····· 35 dB
(3) Usable sensitivity ····· 1000μV

2-4. Cassette deck section

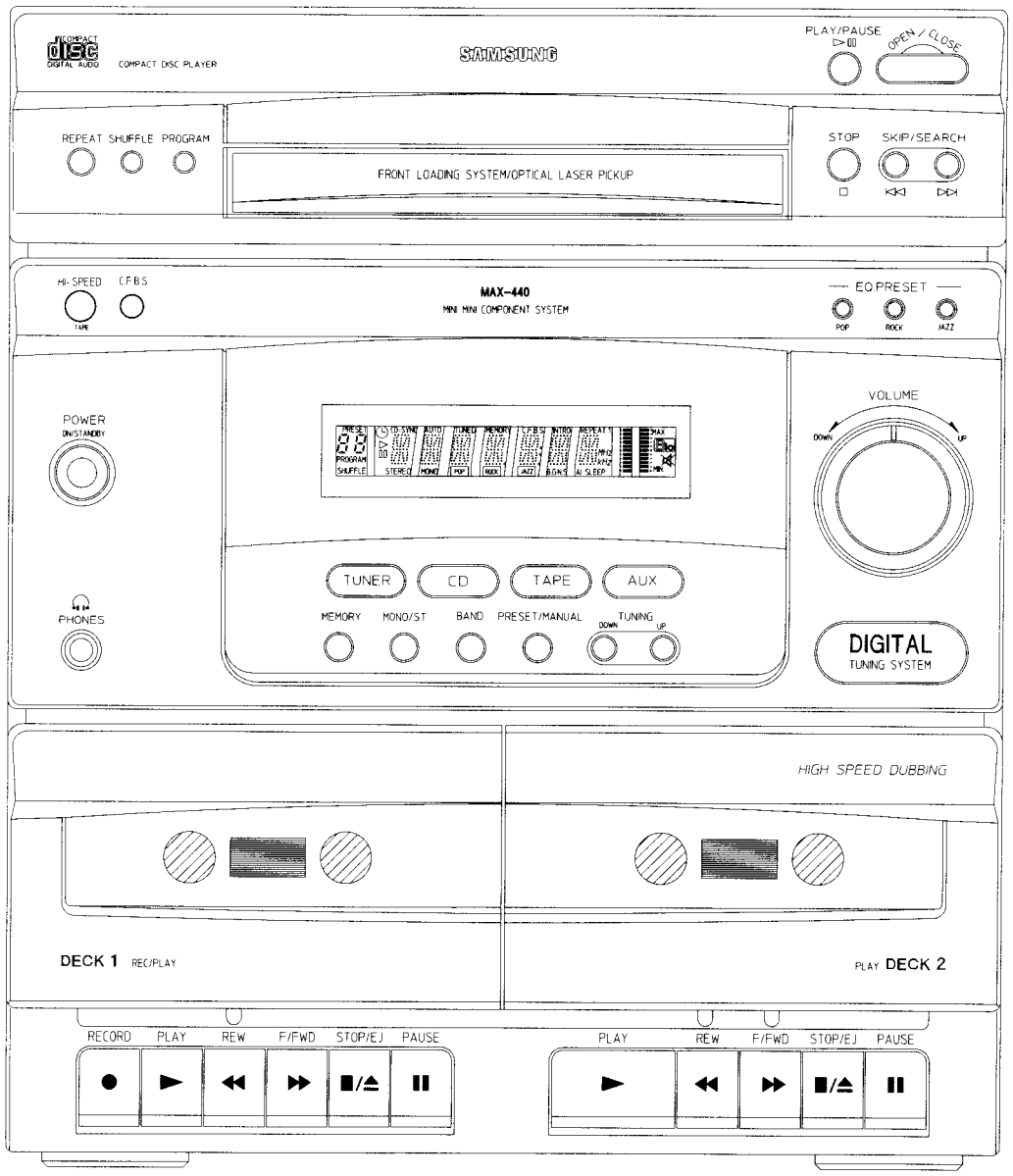
2-4-1. Frequency range ····· 125Hz~8kHz
2-4-2. Signal to noise ratio ····· 40 dB
2-4-3. Separation(STEREO) ····· 35 dB
2-4-4. Total harmonic distortion ····· 2%(Recording mode)
2-4-5. Erasing effect ····· 55 dB

2-5. Compact disc section

(1) Frequency range ····· 20Hz~20kHz(±1dB)
(2) Signal to noise ratio ····· 95 dB(1kHz 0 dB)
(3) Channel separation ····· 85 dB(1kHz 0 dB)
(4) Total harmonic distortion ····· 0.05%(1kHz 0 dB)
(5) D/A conversion ····· 8 over

3. Location of controls

3-1. Front view



4. What is Bio-Rhythm

The scientists found three types of rhythmic activities exist in a human body; each going through a transition cycle from a highest phase to a lowest phase in a regular interval. By retracing the rhythmic pattern they also found that all the patterns are directly related to each person's birthday.

that means the moment a fetus is born out of mother, all three physical rhythms start to be active by experiencing its very first exposure to the outside stimulations such as light, sound, temperature, air and other factors.

This fact indicates that Bio-Rhythm can be determined for a person, once we identify the person's birthday.

4-1. How to Interpret the Graphics of Bio-Rhythm

Our product, MAX-440, is made with a calculating method according to the international standard.

TYPES	DESCRIPTION	CONDITIONS OF RHYTHMIC PHASES		
		ASCENDING	DESCENDING	CRITICAL
RHYTHM FOR PHYSICAL	Physical strength Stamina. Physical tension. Courage	An increased physical strength. Heavy work performance. Quick recovery. Good for travel and sports.	A decrease in physical strength. Fatique. Needs rest constantly	Outburst of fever. Losing body heat. Prone to cold, headache and accidents.
RHYTHM FOR SENSITIVITY	Sensitivity. Sensibility. Creativity. Cooperative spirit.	Energetic. Very active. Better work performance. Seeks for love and dates.	Lethargic. Acting passive. Avoids heavy duty work or any creative work	Emotionally unstable. Frequent mood swings. Short temper. An impropiety in speech. Becomes the source of gossip Worsening of illness.
RYTHM FOR INTELLIGENCE	Intelligence. Thinking power. Improved memory. Better concentration	-Brain Activity- Quick thinking, Active brain function. Good for planning, drafting, review critical judgement. Improved memory and comprehansion of difficult subjects.	-Low Brain Function- Low brain activity. Avoid heavy brain work. Do light work such as data organiztionor review.	Lack of the ability of concentration. Not be able to pay attention. Makes mistakes. Posponement of making important decisions.

4-2. The Function of Bio Sound Quality

After marking the three types of Bio functions, the most appropriate sound quality is chosen for that particular day's Bio-Rhythm depending on the person's sensitivity rhythm. For the person on the ascending phase, a strong quality sound like Rock Music is selected, so that the person could raise his or her work performance rate and result by asserting him/herself more. For the person on the descending phase, a soft quality sound like classical music, so that the person could take a rest or get relaxed.

5. Disassembly instruction

Remove the plug from the wall outled befor disassembling the unit.

5-1. How to disassemble cabinet-top (FIG. 1)

5-1-1. Remve 5 screws ① on the cabinet-top.

5-1-2. Lift the rear part of the cabinet-top at the angle of 40 ~ 60° as indicated by the arrow in FIG.1.

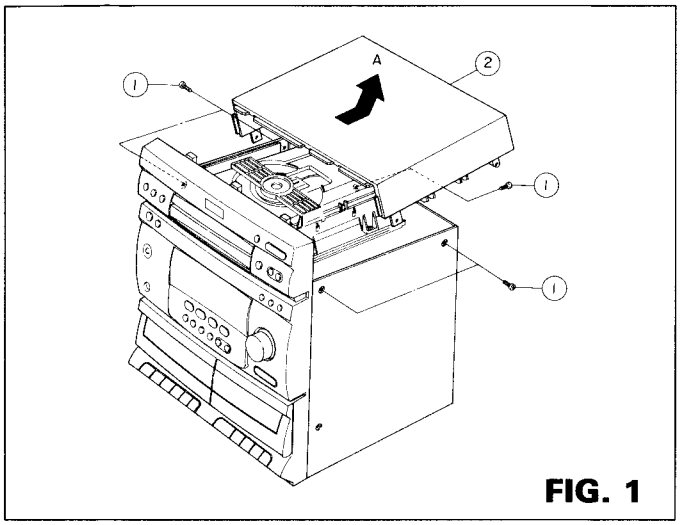


FIG. 1

5-1-2. How to disassemble CD-Mecha, CD-door (FIG. 2)

4-2-1. Remove 4 screws ① & ②.

4-2-2. Lift CD-Mecha with FRAME-CD as indicted by the arrow in FIG.2.

4-2-3. Remove 4 screws ③.

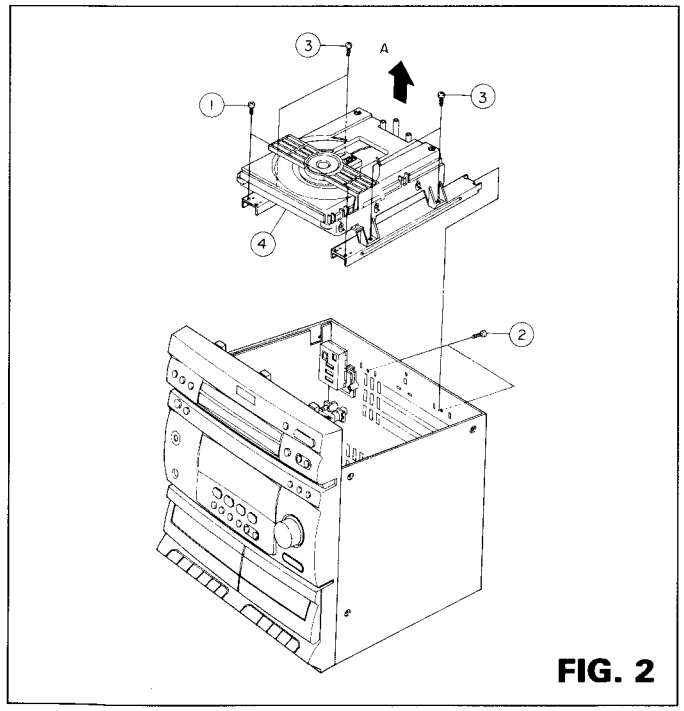


FIG. 2

5-3. How to disassemble cabinet-top & main PCB (FIG.3)

5-3-1. Remove 2 screws ①.

5-3-2. Push 2 Hooks of the bottom using the driver lift panel-front as indicated by the arrow in FIG. 3.

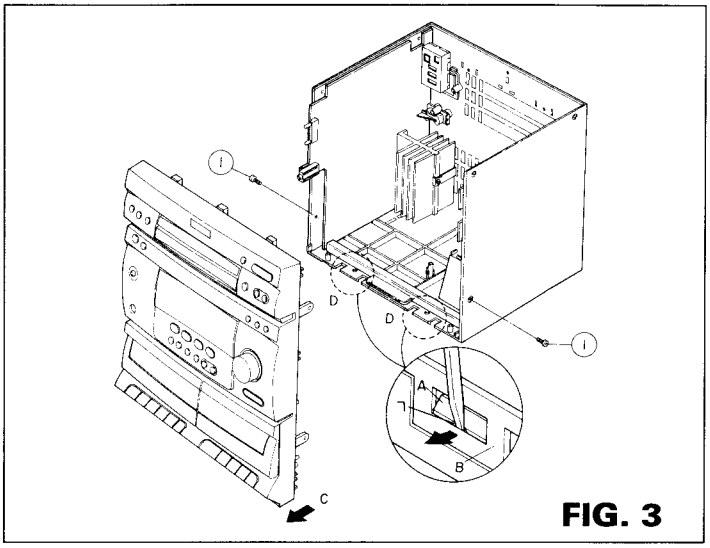


FIG. 3

6. Basic circuit operation

6-1. Amp & Tuner section

6-1-1. LC866220-5837/5847 : UIC1

No.	Port	I/O	Port name	Description	Active
1	P52	I	SENSE	CD CONTROL LSI SENSE	-
2	PWM1	O	N. C	NOT CONNECTED	-
3	P20	O	BGNSON	BGNS CIRCUIT ON/OFF	H
4	P21	O	ST	MSM6654 IC LATCH	L
5	P22	I	NAR	MSM6654 IC NEXT ADDRESS REQUEST	H
6	P23	O	BGNSCLK	MSM6654 IC CLOCK	-
7	P24	O	BGNSRES	MSM6654 IC RESET	L
8	P25	O	BGNSCH	MSM6654 IC CHANNEL SELECT	-
9	P26	O	VOLUMEA	ENDLESS VOLUME INPUT A	H
10	P27	O	VOLUMEB	ENDLESS VOLUME INPUT B	H
11		O	TEST1	TEST PIN	
12		I	RESET	RESET INPUT	
13		I	XT1	SUB OSC (32.768KHZ)	
14		O	XT2	SUB OSC	
15		I	VSS	GND	
16		I	CF1	OSC INPUT	
17		O	CF2	OSC OUTPUT	
18		I	Vdd	POWER	
19	P80	I	OPTION1	TUNER FREQUENCY OPTION	
20	P81	I	OPTION2	SPEC. OPTION	
21	P82	I	HISPIN	HIGH-SPEED DUBBING MODE INPUT	
22	P83	I	KEY1	A/D KEY INPUT 1	L
23	P84	I	KEY2	A/D KEY INPUT 2	
24	P85	I	RECIN	REC. INPUT	
25	P86	I	LEVEL R	INPUT LEVEL 'R'-CH	
26	P87	I	LEVEL L	INPUT LEVEL 'L'-CH	L
27	P70	I	SCOR	SCOR INPUT	
28	P71	I		B+ CONNECTION	H
29	P72	I	PSENSE	POWER CORD OFF SENSE	
30	P73	I	REMOTE	REMOCON SIGNAL INPUT	L
31		O	T0	GRID 0	L
32		O	T1	GRID 1	
33		O	T2	GRID 2	
34		O	T3	GRID3	
35		O	T4	GRID4	
36		O	T5	GRID5	
37		O	T6	GRID6	
38		O	T7	GRID7	
39		O	T8	GRID8	
40		O	T9	GRID9	
41		O	T10	GRID10	
42		O	T11	GRID11	
43		O	T12	GRID12	
44		O	T13	GRID13	
45		O	T14	GRID14	
46		O	T15	GRID15	
47		O	Vdd Vpp	POWER	
48		O	Vp	FLT POWER	

No.	Port	I/O	Port name	Description	Active
49		O	S16	SEGMENT 0	
50		O	S17	SEGMENT 1	
51		O	S18	SEGMENT 2	
52		O	S19	SEGMENT 3	
53		O	S20	SEGMENT 4	
54		O	S21	SEGMENT 5	
55		O	S22	SEGMENT 6	
56		O	S23	SEGMENT 7	
57		O	S24	SEGMENT 8	
58		O	S25	SEGMENT 9	
59		O	S26	SEGMENT 10	
60		O	S27	SEGMENT 11	
61		O	S28	SEGMENT 12	
62		O	S29	SEGMENT 13	
63		O	S30	SEGMENT 14	
64		O	S31	SEGMENT 15	
65	P00	O	PHONOLD	PHONO LED	L
66	P01	O	TUNERVD	TUNER B+	H
67	P02	O	AUXLD	AUX LED	L
68	P03	O	TAPELED	TAPE LED	L
69	P04	O	CD LED	CD LED	L
70	P05	O	TUNERLD	TUNER LED	L
71	P06	O	OPENMT	DOOR OPEN MOTOR	H
72	P07	O	CLOSEMT	DOOR CLOSE MOTOR	H
73	P10	I	GFS	GFS INPUT	H
74	P11	I	SQDATA	SUB-Q DATA	-
75	P12	O	SQCK	SUB-Q CLOCK	-
76	P13	O	DATA	LSI DATA	-
77	P14	O	CD /MUTE	CD MUTE	H
78	P15	O	CLK	LSI CONTROL CLOCK	-
79	P16		N.C	NOT CONNECTED	-
80	P17	O	XLT	LSI LATCH	L
81	P30	O	AMUTE	AUDIO MUTE	H
82	P31	O	HISPTR	HI-SPEED TR	H
83	P32	O	MONO/ST	MONO (=1) / STEREO (=0)	-
84	P33	I	STEREO	STEREO SENSE INPUT	L
85	P34	I	STOUT	DTS STOP INPUT	L
86	P35	O	PHOAUX	PHONO (=1) / AUX (=0)	-
87	P36	I	SD	STATION INPUT	L
88	P37	O	STRQ	IF REQUEST	H
89			Vss	GND	
90			Vdd	POWER	
91	P40	O	PLLCE	PLL CE	H
92	P41	O	DATAC	PLL/FUNC/BGNS DATA	-
93	P42	O	CLKC	PLL/FUNC CLOCK	-
94	P43	O	MPXMUTE	MPX MUTE	H
95	P44	O	POUT	POWER ON	H
96	P45	I	OPENSW	TRAY OPEN S/W INPUT	L
97	P46	I	CLOSESW	TRAY CLOSE S/W INPUT	L
98	P47	O	XRST	CD LSI RESET	L
99	P50	I	FOK	FOCUS OK INPUT	H
100	P51	O	LDON	LASER DIODE	L

Pin No.	Symbol	I/O	Description
51	C2FL	I/O	C2 decoder flag (High:When the processing C2 code is impossible correction stage(RA5)
52	/PBCK	I/O	Output of VCO/2(Normal speed = 4.3218MHz) (Double speed = 8.6436MHz)(RA6)
53	DVSS2		Digital Ground2
54	FSDW	I/O	Unprotected frame Sync(RA7)
55	ULKFS	I/O	Frame sync protection state(RA8)
56	/JIT	I/O	Display of either RAM overflow or under flow for ±4 frame Jitter margin(RA9)
57	C4M	I/O	Only Monitoring signal(Normal Playback:4.2336MHz)(RA10)
58	C16M	I/O	16.9344MHz signal output(RA11)
59	/WE	I/O	Terminal for test
60	/CS	I/O	Terminal for test
61	SEL1	I	Mode Selection Terminal 1(H:33.8688MHz) (L:16.9344MHz)
62	SEL2	I	Mode Selection Terminal 2(H:APLL) (L:DPLL)
63	/SEL3	I	Mode Selection Terminal 3(H:CDROM) (L:CDP)
64	/SEL4	I	Mode Selection Terminal 4
65	TEST	I	Test Terminal(L:Normal operation state)
66	EFMI	I	EFM Siganl input
67	APDO1	O	Charge Pump output for analog PLL
68	/ISTAT	O	The internal status output
69	TRCNT	I	Tracking counter input signal
70	LOCK	O	output signal of LKFS condition sampled PBFR/16 (If LKFS is "H", Lock is "H". If the LKFS is sampled ":L" at least 8times by PBFR/16, Lock is "L")
71	PBFR	O	Write frame clock(Lock:7.35KHz)
72	SMEF	O	LPF time constant control of the spindle servo error signal
73	SMON	O	ON/OFF control signal for spindle servo
74	DVDD2	O	Digital Vcc2
75	SMPD	O	Spindle Motor drive(Rough control in the CLV-S mode Phase control in the CLV-P mode)
76	SMSD	O	Spindle Motor drive(Velocity control in the CLV-P mode)
77	VC001	O	Vco output signal (When the state is Lock by means of PBFR it is 8.6435MHz)
78	VCOI1	I	VCO input signal
79	Dspeed	I	Double speed mode control(H:Normal speed) (L:Double speed)
80	APDO2	O	Analog PLL charge pump output for Double speed mode

6-2. CD section

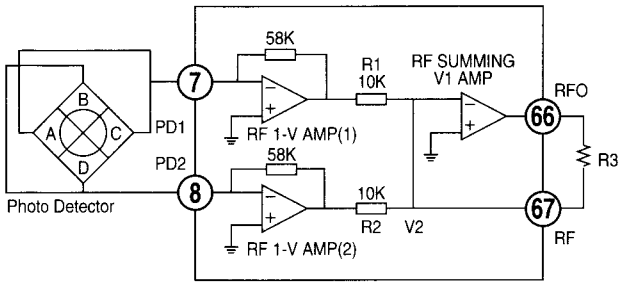
6-2-1. KA9220(RF+SSP) : NIC9220

Pin No.	Name	Description
1	AVEE(R)	Analog negative power supply input pin for RF part.
2	CPH	Capacitor connection pin of mirror hold.
3	CBH	Capacitor connection pin of defect bottom-hold
4	TESTD	Defect test pin
5	TESTM	Mirror test pin
6	Test 1	Input pin for test
7	PFSET	Peak frequency setting pin for focus, tracking compensation and fc (cut off frequency) of CLV LPF
8	SSTOP	Check the position pin of pick-up whether inside or not.
9	DIRC	Direct 1 Track Jump Control Pin
10	AVCC	Analog positive power supply input pin for SERVO part.
11	WDCH	Auto-sequencer clock-input pin (Normal speed=88.2KHz, Double speed=176.4KHz)
12	SMPD	Connection pin of DSP SMPD
13	SMON	Connection pin of DSP SMON, spindle servo ON at "H"
14	N/C	No connection pin
15	TGSW	Providing time constant to change the high frequency tracking gain
16	RTG	Capacitor connection pin to switch the tracking gain of high frequency
17	LFR	Capacitor connection pin to perform rising low bandwidth of focus servo loop
18	FSW	High frequency gain of focus servo loop can be changed by FS3 switch ON or OFF
19	HFGD	Reducing high frequency gain with capacitor connected between pin 18 and pin 19.
20	FSCH	Time constant external pin to generate focus search waveform
21	VREGI	External regulator voltage input pin for VCO
22	ISET	Determing the peak value of focus search, track jump and SLED kick
23	VREG	3.5V Regulator output pin
24	FVC	Pin connected external resistor to adjust free running frequency of VCO
25	SMEF	Providing an external LPF time constant of CLV SERVO Loop
26	BPF	Providing time constant for Loop filter of VCO
27	MCK	Clock input pin from μ-com
28	MLT	Latch input pin from μ-com
29	MDAT	Data input pin from μ-com
30	RESET	Reset input pin from μ-com, reset at "L"
31	LOCK	Pin for operation of the sled runaway prevention function at "L"
32	TRCNT	Track count output pin
33	ISTAT	Internal status output pin
34	AVEE	Analog negative power supply input pin for SERVO part
35	APDI	Input pin of DSP phase comparison output(PHAS)
36	F8M	Output pin of analog VCO Normal speed=8.64MHz, Double speed=17.28MHz
37	AASC	Auto-Asymmetry control input pin
38	EFMO	EFM Comparator output pin
39	SLEN	Non-inverting input pin of SLED SERVO amplifier
40	SLEO	Output pin of SLED SERVO amplifier
41	SLEI	Inverting input pin of SLED SERVO amplifer
42	TEST2	Test input pin to change speed mode Normal speed="H", Double speed="L"
43	SPDI	Inverting input pin of spindle servo amplifier
44	SPDLO	Spindle servo amplifier output pin
45	FCE	Invering input pin of focus servo complifier
46	FSE0	Output pin of focus servo amplifier
47	TKEI	Non-inverting input pin of tracking servo amplifier
48	TKE0	Output pin of tracking servo amplifier
49	N/C	Noconnection
50	ATS	Anti-shock input pin

Pin No.	Name	Description
51	TZC	Tracking Zero Crossing input pin
52	TE2	Tracking Error Servo input pin
53	TE1	Output pin of tracking Error amplifier
54	TDFCT	Capacitor Connection pin for Defect Compensation of tracking servo
55	DVCC	Digital positive power supply input pin for servo part
56	FE2	Focus error servo input pin
57	FE1	Output pin of focus error Amplifier
58	FDFCT	Capacitor connection pin for defect compensation of focus servo
59	FOK	Output pin of Focus ok comparator.
60	LDON	Laser diode ON/OFF control pin
61	EI	Feedback input pin of EI-V amplifier
62	EO	Output pin of E I-V amplifier
63	FBIAS	Bias pin of non-inverting input of focus error amplifier
64	DVEE	Digital negative power supply input pin for servo part
65	RFI	Output Signal of RF summing amplifier is inputed through capacitor
66	RFO	Output pin of RF summing amplifier
67	RF-	Inverting input pin of RF summing amplifier
68	RV	Output pin of (AVCC + AVEE)/2 Voltage
69	CV	Bias input pin of Center Voltage Buffer
70	LD	Output pin of APC amplifier
71	PD	Input pin of APC amplifier
72	AVCC	Analog positive power supply input pin for RF part
73	N/C	No connection
74	PD2	Inverting input pin of RF I-V AMP2
75	PD1	Inverting input pin of RF I-V AMP1
76	F	Inverting input pin of F I-V AMP
77	E	Inverting input pin of E I-V AMP
78	P/N	Selecting P-sub/N-sub of Laser diode
79	DCC2	Defect bottom-hold output is inputed through capacitor
80	DCC1	Output pin of defect bottom-hold

6-2-2. CD section

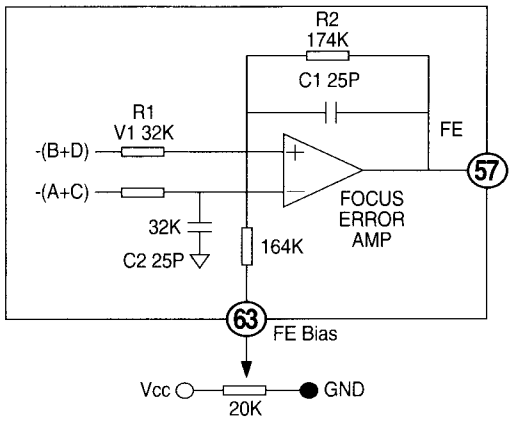
1) RF Amp(KA9220) : NIC9220



RF I-V Amp(1) and RF I-V Amp (2) are converted to voltage via internal resistance of 58kΩ from the current of PD1(A+C) and PD2 (B+D) ; then, this voltage is added to RF summing amplifier. The signal (A+B+C+D) is applied to RFO (No.2 terminal).
RF output voltage can be calculated as follows:

VRF = -R3 x (iPD1 + iPD2)
=-R3 x (V1/R1 + V2/R2)
=-R3 x (V1/10K + V2/10K)
=-R3/10K x (V1 + V2)

2) FOCUS ERROR Amp(KA9220) : NIC9220



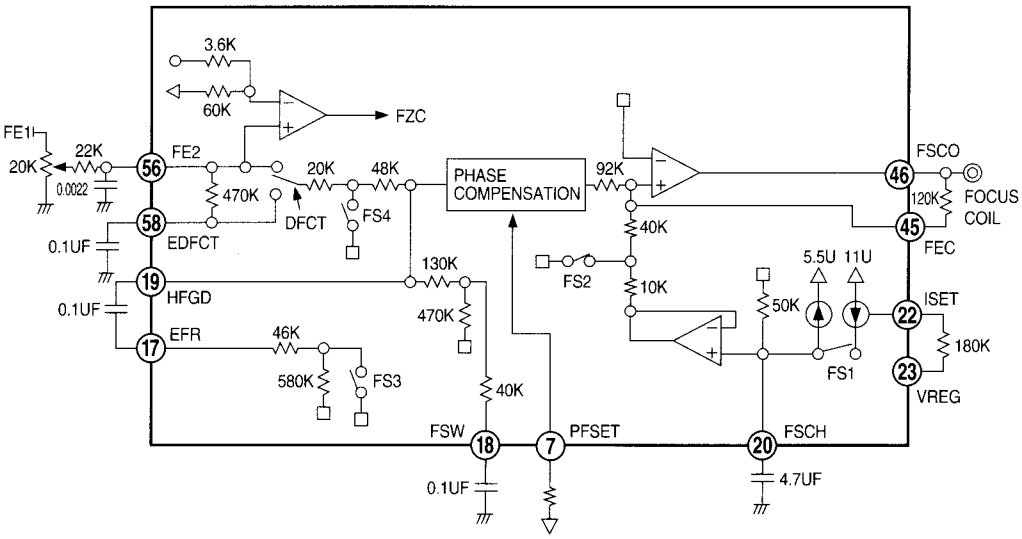
FOCUS ERROR Amp is the circuit which amplifies the difference between RF I-V Amp(1) output(A+C) and RF I-V Amp(2) output (B+D).
These two signals are supplied to (-) and (+) input terminals of FOCUS ERROR Amp. The FOCUS ERROR signal resulting from this difference voltage is applied to FE (Terminal No. 57). The FE output voltage of this low frequency component varies depending on { (A+C) - (B+D) }.
VFE can be obtained as follows.

VFE = (R2/R1) x (V2-V1) = 5.4(V2-V1)

This FOCUS ERROR voltage is sent to FOCUS SERVO circuit to maintain optimum focusing.

3) FOCUS SERVO SYSTEM(KA9220) : NIC9220

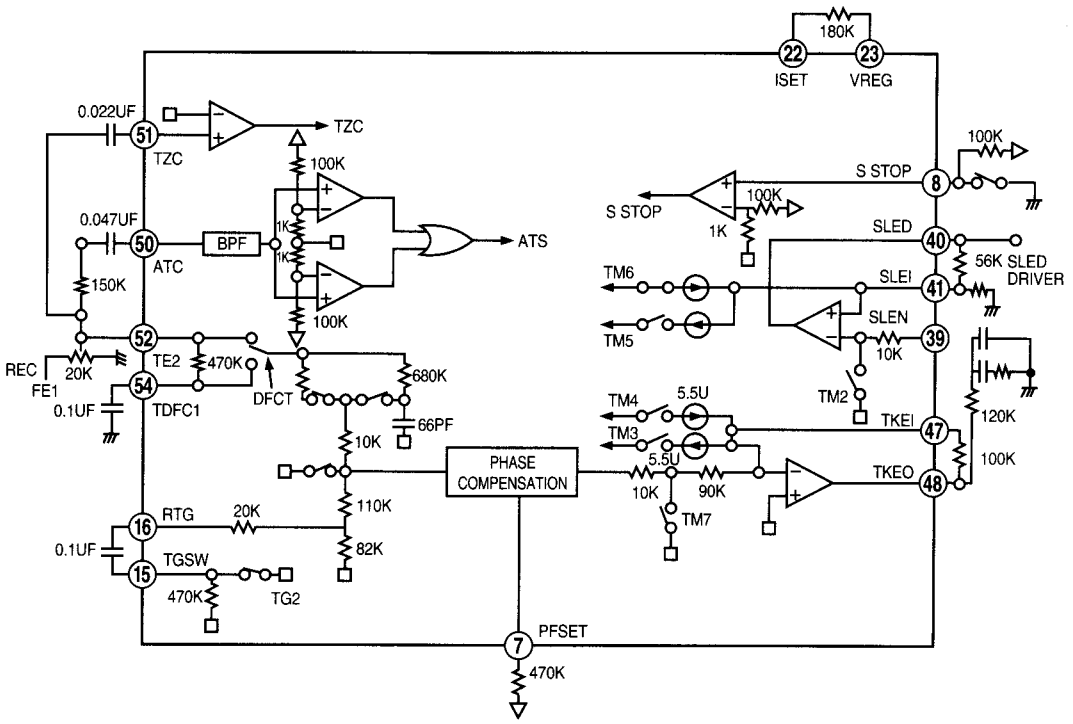
The diagram of Focus Servo System is shown in the following.
When FS3 is ON, high frequency gain decreases in the form of low frequency time constant by pin 17, pin 19, and capacitor connected to internal resistance.
The capacitor between pin18 and GND has the time constant picking up the low frequency operated in PLAY mode.



The maximum frequency of focus phase compensation is inversely proportional to the resistance connected to pin7.
Focus search peak is about 1.1 Vp-p, and is inversely proportional to the resistance connected to pin22,23 ; however, if this resistance changes, the peak of track jump and sled kick changes.
The inversion input of FZC comparator is set to 5.7% of the difference between Vcc and VC(pin69) { 5.7% x (Vcc -VC) }.
Note: If the resistance connected to pin 7 changes, the phase compensation peak of focus, tracking, sled servo changes. At the same time, 'op-amp' dynamic range and offset voltage also change.

4) TRACKING SLED SERVO SYSTEM(KA9220) : NIC9220

The diagram of Tracking Sled Servo System is shown in the following. The capacitor between pin15 and 16 has a time constant, and lowers the high frequency when TG2 is off. The maximum frequency of tracking phase compensation is inversely proportional to the resistance connected to pin7(about 1.2KHz at 470K). The tracking jump in the direction of FWD and REV is decided when TM3 and TM4 are ON, and the peak voltage induced from tracking coil is decided by the both TM3 and TM4 current values, and feed back resistance of pin47.
Track jump max. Voltage= TM3(TM4) current x feedback resistance.



FWD or REV sled kick is carried out when TM5 of TM6 is ON , and the peak voltage added to sled motor is decided by TM5 or TM current and the feedback resistance of pin no. 41.
Sled jump max. voltage = TM5(TM6) current x feedback resistance.
Each SW current is decided by the resistance connected to pin no.22 and 23.
When the resistance is about 150kΩ.

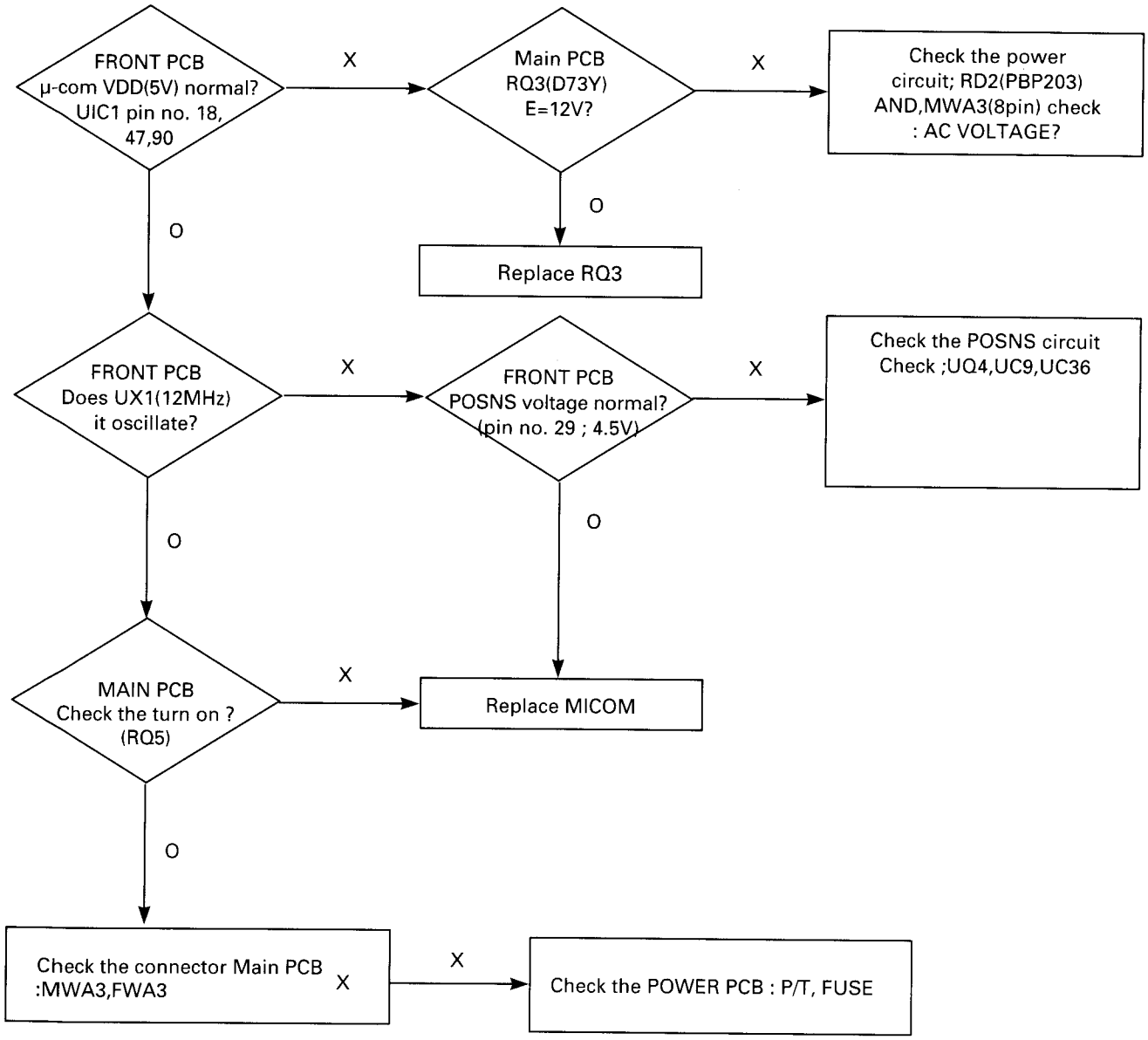
TM3 or TM4 = 11μA ;
TM5 or TM6 = 22μA.

This current is value is almost inversely proportional to the resistor, variable within a range of about 5 to 40μA for TM3.
STOP is the ON/OFF detection signal for the limit SW or the sled motor's innermost circumference.

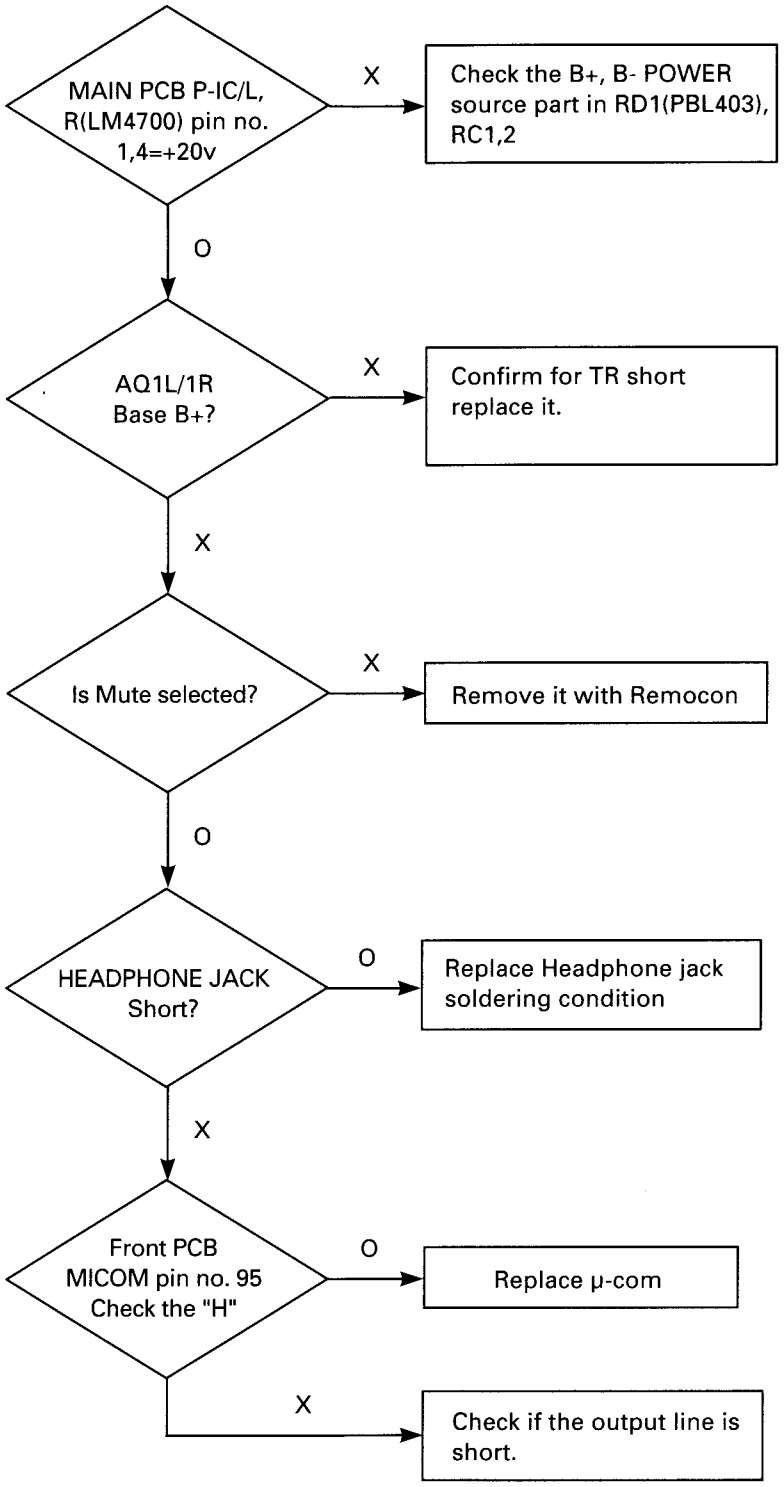
7. Troubleshooting

7-1. The Amplifier section

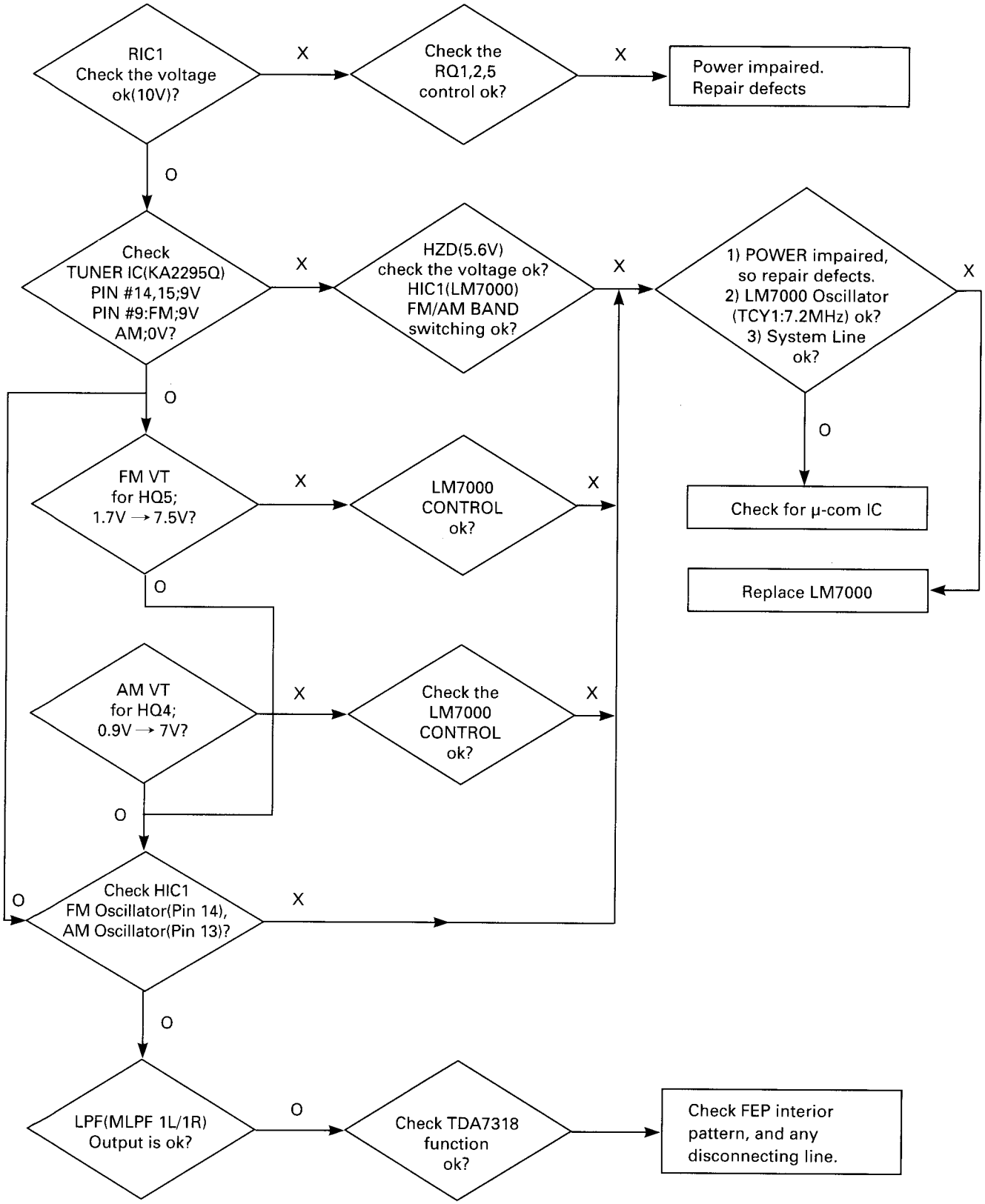
7-1-1. Power malfunction



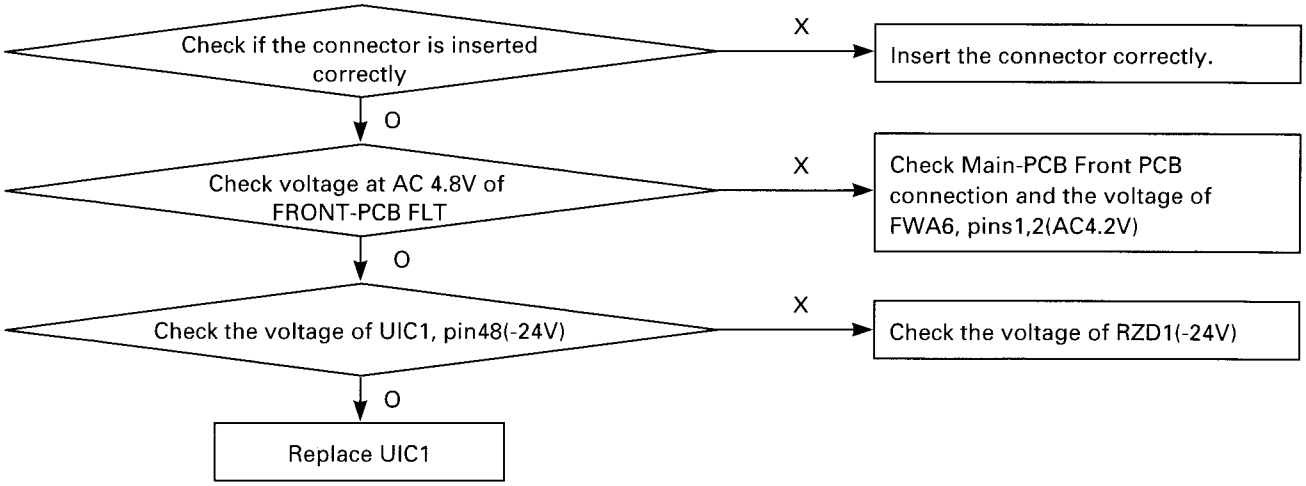
7-1-2. No output power



7-1-3. Tuner malfunction(FM/AM)

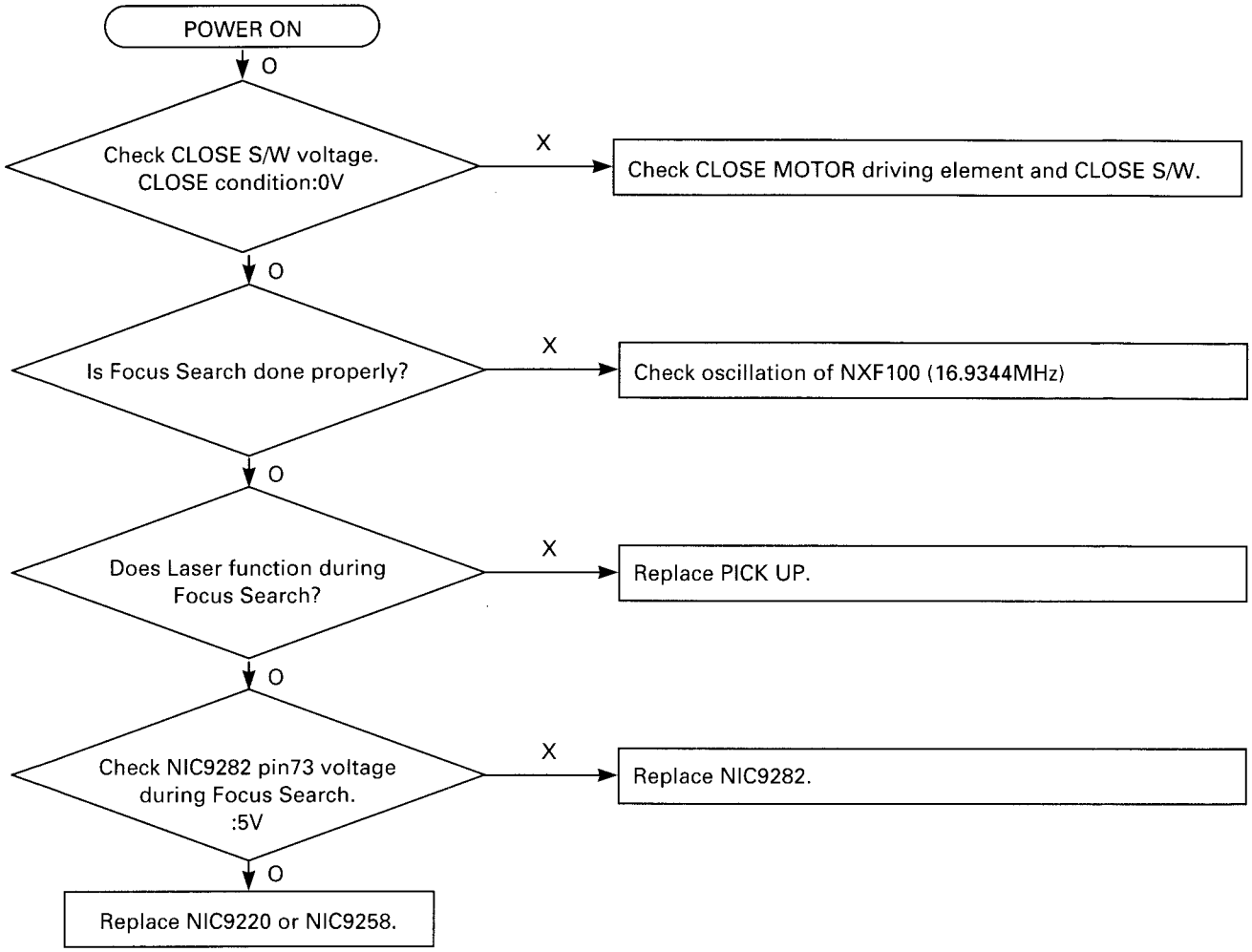


7-1-4. F.L.T. malfunction

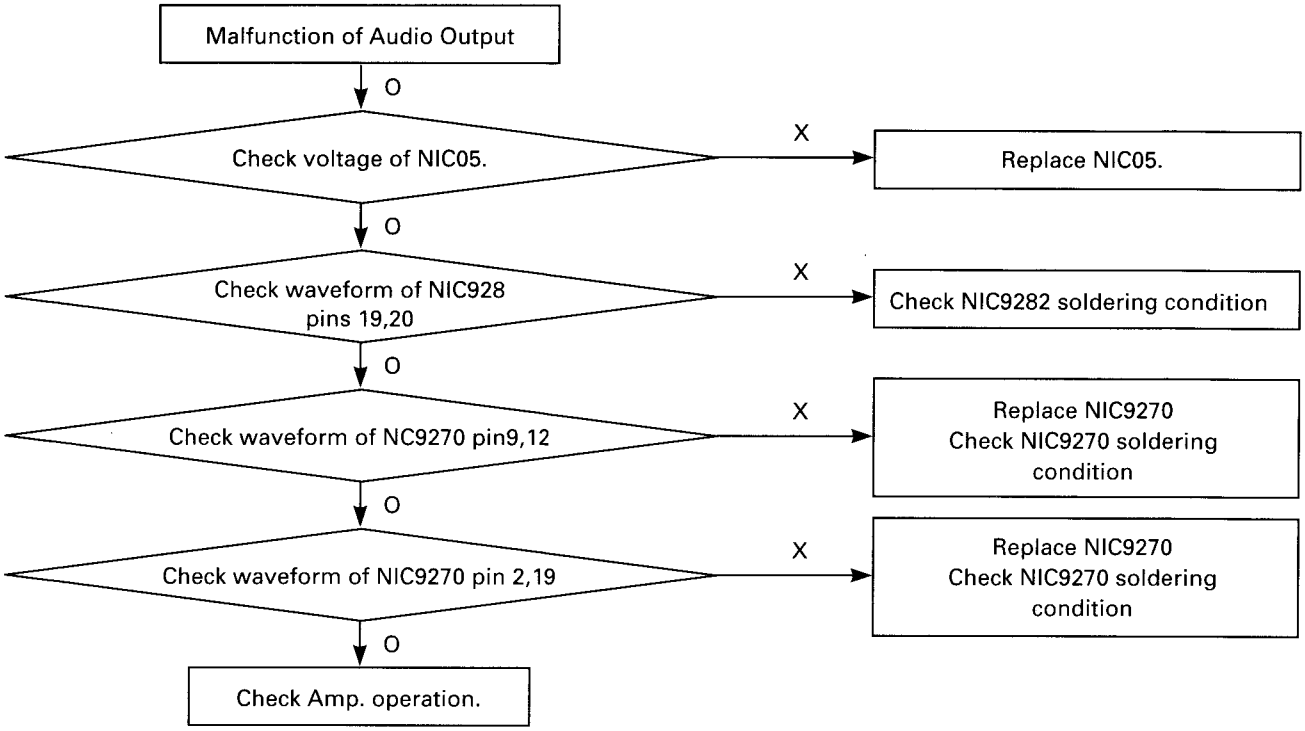


7-2. CD section

7-2-1. Malfunction of DISC Revolution



7-2-2. Malfunction of Audio output



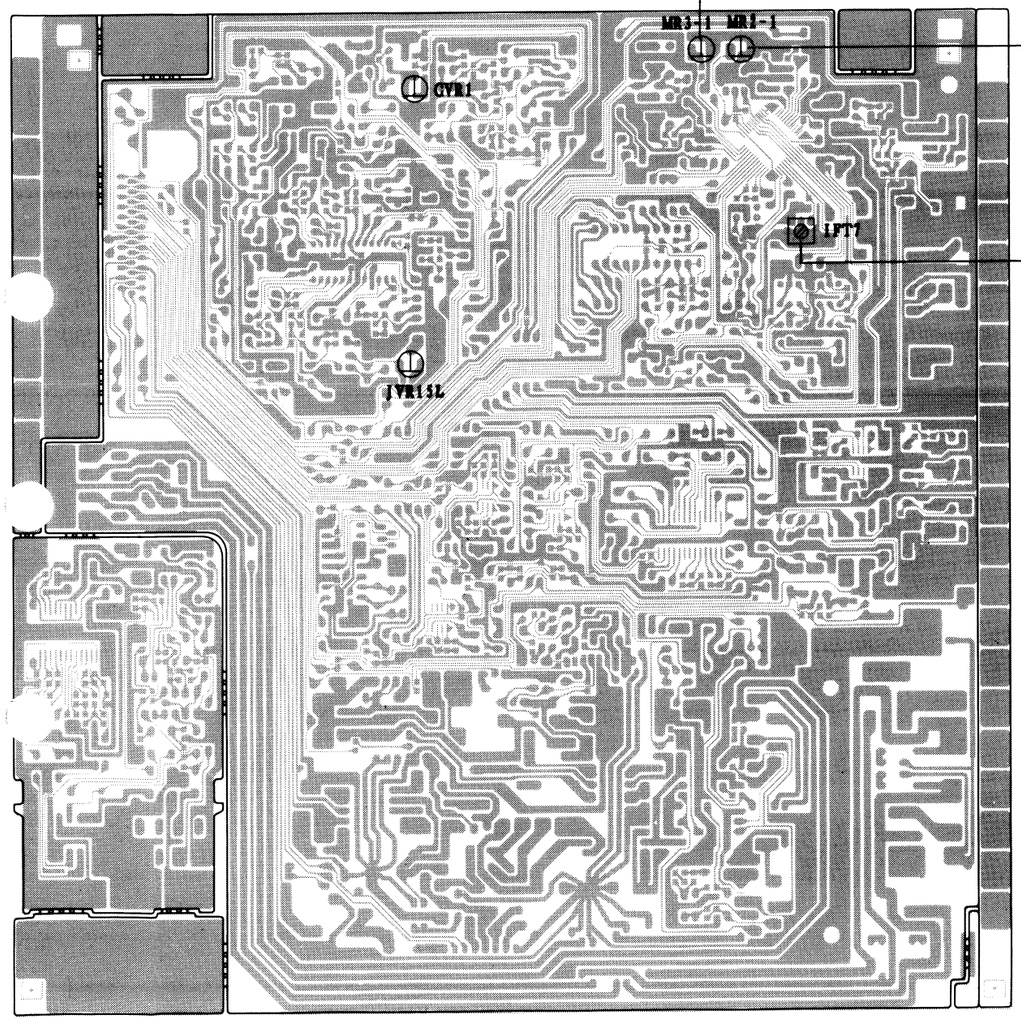
7-3. Cassette deck section

7-3-1. Troubleshooting chart

<table>
<tr><th>Block</th><th>Main function</th><th>Check point</th></tr>
<tr><td>TAPE IC JIC1
(KA22291)</td><td>● Convert of P/B& R/P signal</td><td>● Check for voltage at pin no. 5
1 P/B deck ; H
2 P/B deck ; L</td></tr>
<tr><td>BIAS OSC</td><td>● Oscillate RECORD BIAS (85KHz)</td><td>● LC2 check
Osc Frequency ; 85KHz
● When inoperative ; LQ4, LQ3 check</td></tr>
<tr><td>R/P Switching</td><td>● Convert of PLAY/RECORD</td><td>● Check for voltage at pin no. 16,8
<table>
<tr><th>Mode</th><th>Pin no. 16,8</th></tr>
<tr><td>Rec.</td><td>9V</td></tr>
<tr><td>PLAY</td><td>0V</td></tr>
</table>
</td></tr>
</table>

8. Adjustment

8-1. Tuner section



FM STEREO Adjustment	
SSG FREQ.	98MHz
Adjustment point MR3-1	SEMI-VR(5KB)
L-CH/R CH : Maximum	

FM Search Level Adjustment	
SSG FREQ.	98MHz
Adjustment point MR2-1	SEMI-VR(50KB)
"TUNED" is shown on FLT	

FM T.H.D Adjustment	
SSG FREQ.	98MHz
Adjustment point IFT7	FM DETECTOR COIL
Minimum output	

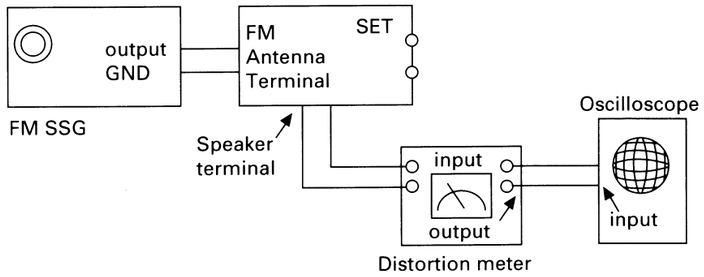


Fig.1) IF Center & T.H.D Adjustment

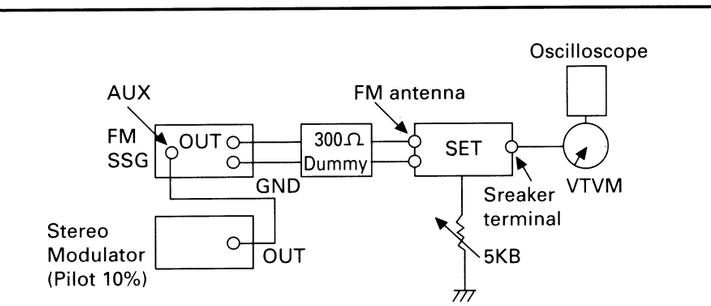


Fig.2)FM STEREO separation Adjustment

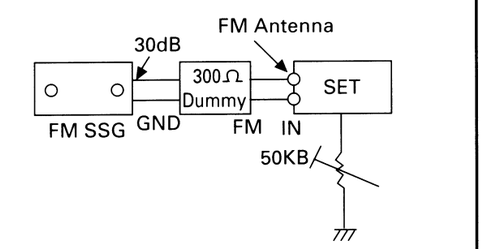


Fig.3)FM Auto search Level Adjustment

8-2. Tape section

8-2-1. Measuring instruments required

(1) Oscilloscope
(2) VTVM
(3) TAPE
  ① MTT-111 (or equivalent) : 3KHz signal is recorded ⟶ tape speed
  ② MTT-5511 (or equivalent)
  ③ MTT-113CN (or equivalent) : 8KHz signal is recorded. ⟶ Azimuth
  ④ MTT-112B (or equivalent) : 1KHz 0dB signal is recorded. ⟶ L.R unbarance

8-2-2. Location of adjustment points (parts side)

— Refer to page30.

8-2-3. Adjustment procedure

(1) Tape speed

Step	Item	Contection	Preparation	Adjustment point	Result & remark
1	Normal speed adjustment	FIG. 1	Insert MTT-111 to DECK 2. Press PLAY button.	CVR1	3KHz
2	High speed	FIG. 1	Insert MTT-111 to DECK 2. PRESS PLAY button.	—	5200Hz~ 6600Hz

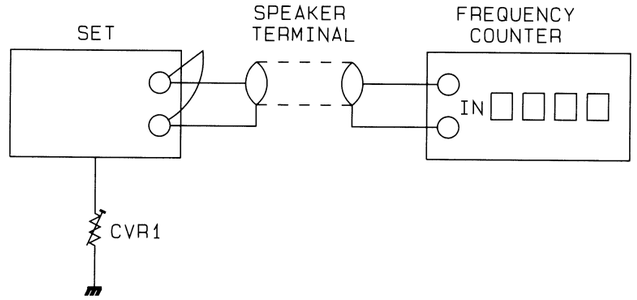


FIG. 1

(2) AZIMUTH
① DECK 1

Step	Item	Contection	Preparation	Adjustment point	Result & Remark
1	AZIMUTH DECK 1.	FIG. 2	Play MTT 113CN in the DECK 1.	FIG. 3	Maximum output and same phase of L, R-CH. Fix the screw.
2	L, R UNBALANCE	–	Play MTT-112B in the DECK 1.		L-CH → R-CH ± 0.5dB

② DECK 2

Step	Item	Contection	Preparation	Adjustment point	Result & Remark
1	AZIMUTH	FIG. 2	Play MTT 113CN in the DECK 2.	FIG. 3	Maximum output and same phase of L, R-CH. Fix the screw.

(3) Record and Playback adjustment

Step	Item	Contection	Preparation	Adjustment point	Result & Remark
1	Bias oscillation frequency	Both extremes LC2	Record MTT-5512 in the DECK 2	LL1	85KHz

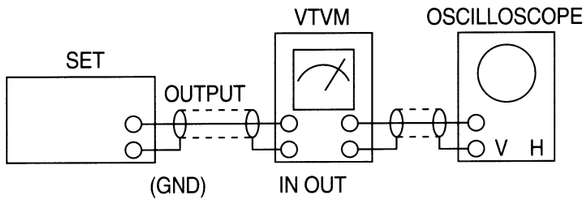


FIG. 2

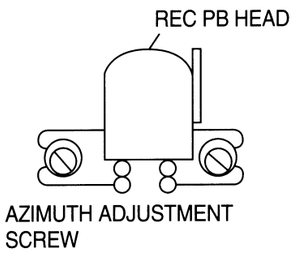
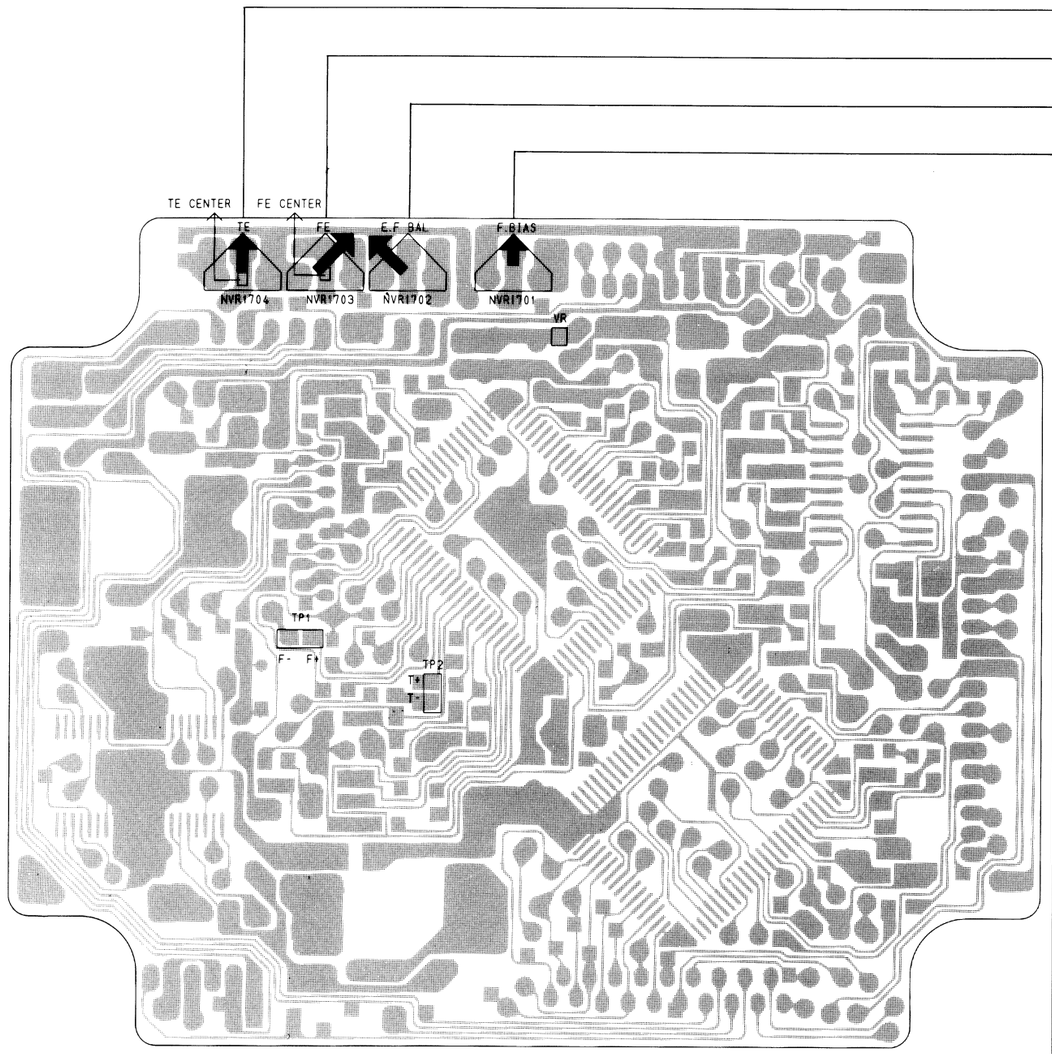


FIG. 3

8-3. CD section



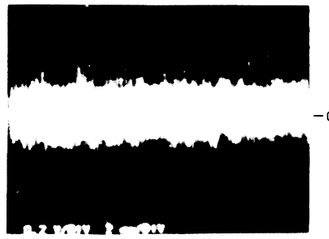
8-3-1. To Adjust FOCUS BIAS (STOP mode)

1) Set Volt/Div of the oscilloscope at DC 100mV.
2) In GND condition of the oscilloscope, set the waveform at 0V, and then set it in the DC range.
3) Connect the GND disconnector of the oscilloscope at VR, and(+) disconnector to center of NVR 1703.
4) By using NVR1701 set it at 0m√.

8-3-4. To Adjust Tracking gain (PLAY mode)

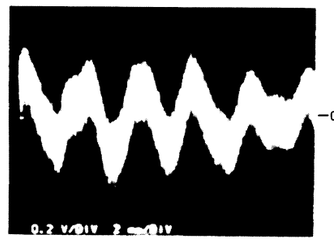
1) Connect;GND disconnector of the oscilloscope to VR and (+) disconnector to TP2.
2) Load and play the disc.
3) While the disc is running adjust the gain with NVR1704 as shown in the following picture.

(Normal frequency)



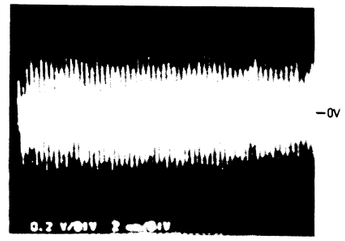
VOLT/DIV: 0.2V
TIME/DIV: 2mS

(Low frequency)



VOLT/DIV: 0.2V
TIME/DIV: 2mS

(High frequency)

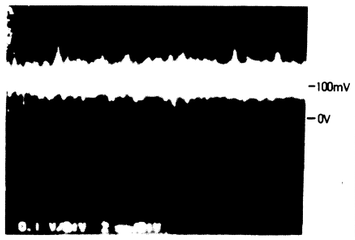


VOLT/DIV: 0.2V
TIME/DIV: 2mS

8-3-3. To Adjust Focus Gain (PLAY mode)

1) Connect; GND disconnector of the oscilloscope to VR and (+) disconnector to TP1.
2) Load and play the disc.
3) While the disc is running adjust the gain with NVR1703 as shown in the following picture.

(Normal frequency)



VOLT/DIV: 0V
TIME/DIV: 2mS

(Low frequency)

VOLT/DIV: 0.1V
TIME/DIV: 2mS

(High frequency)

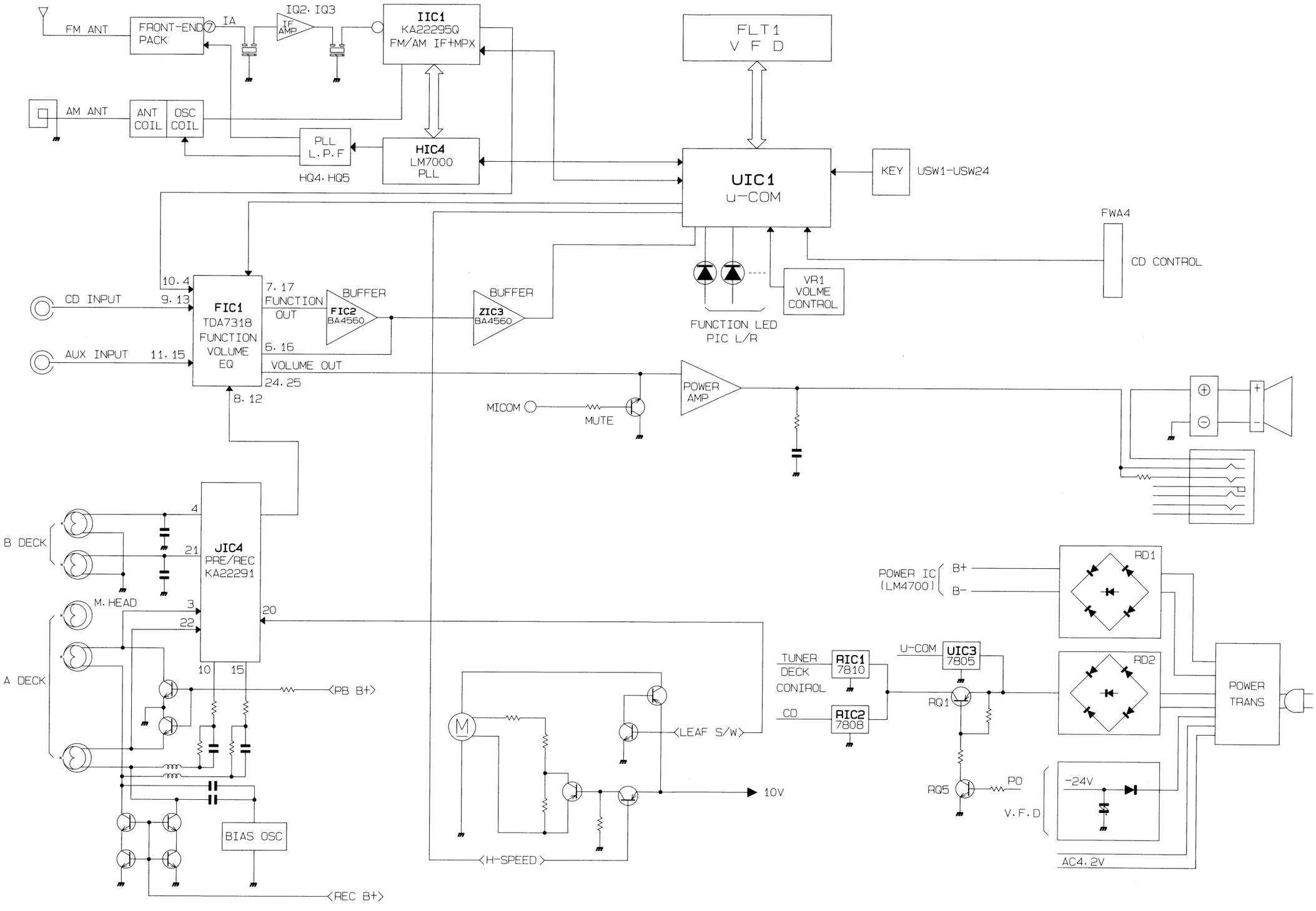
VOLT/DIV: 0.1V
TIME/DIV: 2mS

8-3-2. To Adjust E/F Balance (PLAY mode)

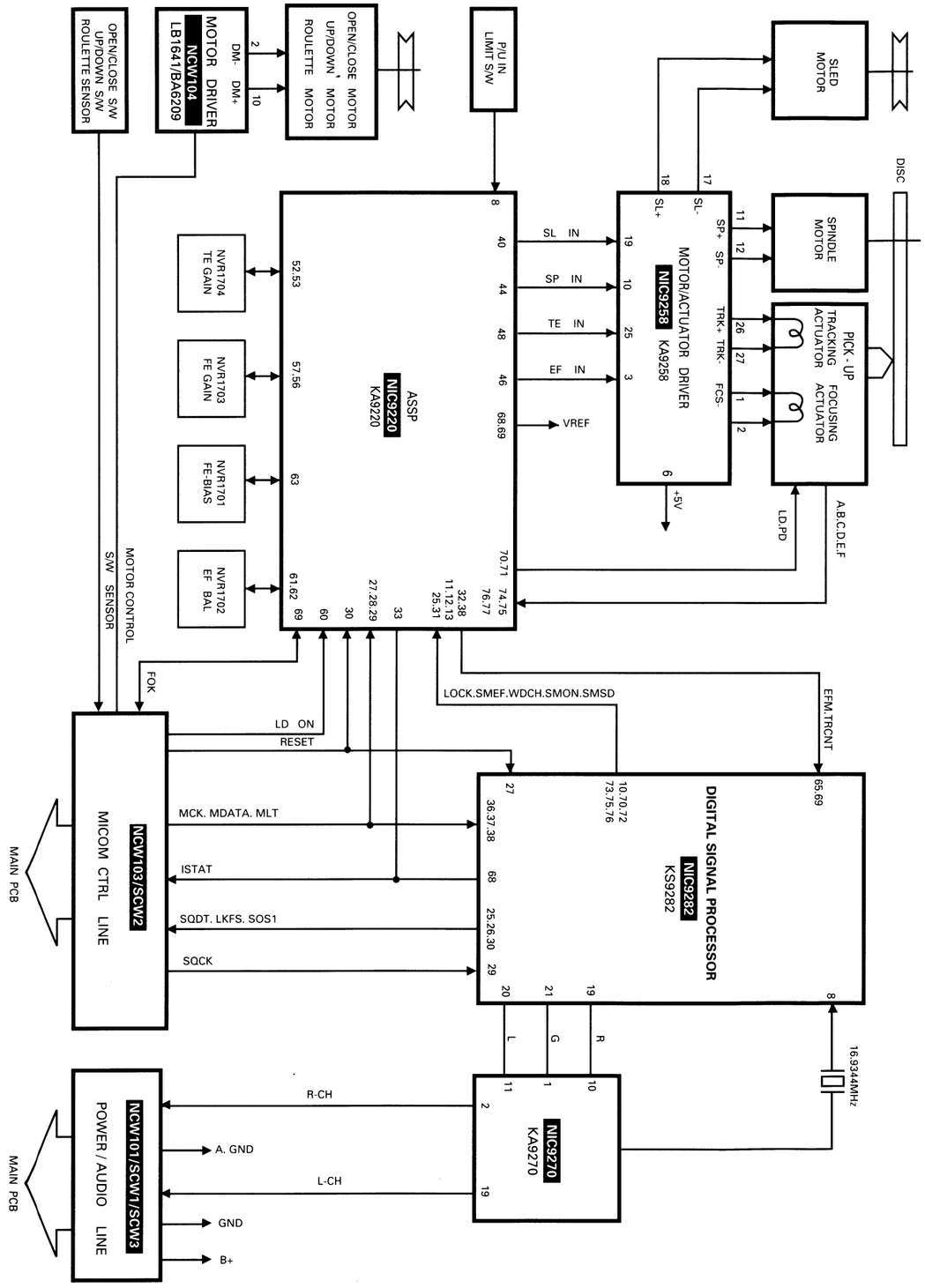
1) Set TIME/DIV of the oscilloscope at 2mS.
2) Set Volt/DIV of the oscilloscope at 0.5V
3) At GND setting of the oscilloscope set the waveform at 0v and then set it in the DC range.
4) Connect; GND disconnector of the oscilloscope t VR and (+)disconnector to center of NVR1704.
5) Load and play the disc.
6) Turn NVR1704 unclockwise to the minimum value.
7) Raise NVR1702 and adjust the waveform so that the middle of wave comes to the GND of the oscilloscope or until the upper half of wave form becomes symmetrical to the buttom half. (A=B)
8) Adjust NVR1704 in the arrow direction to achieve a normal sound effect.

9. Block diagram

9-1. Main section



9-2. CD section



10. Exploded view & parts list

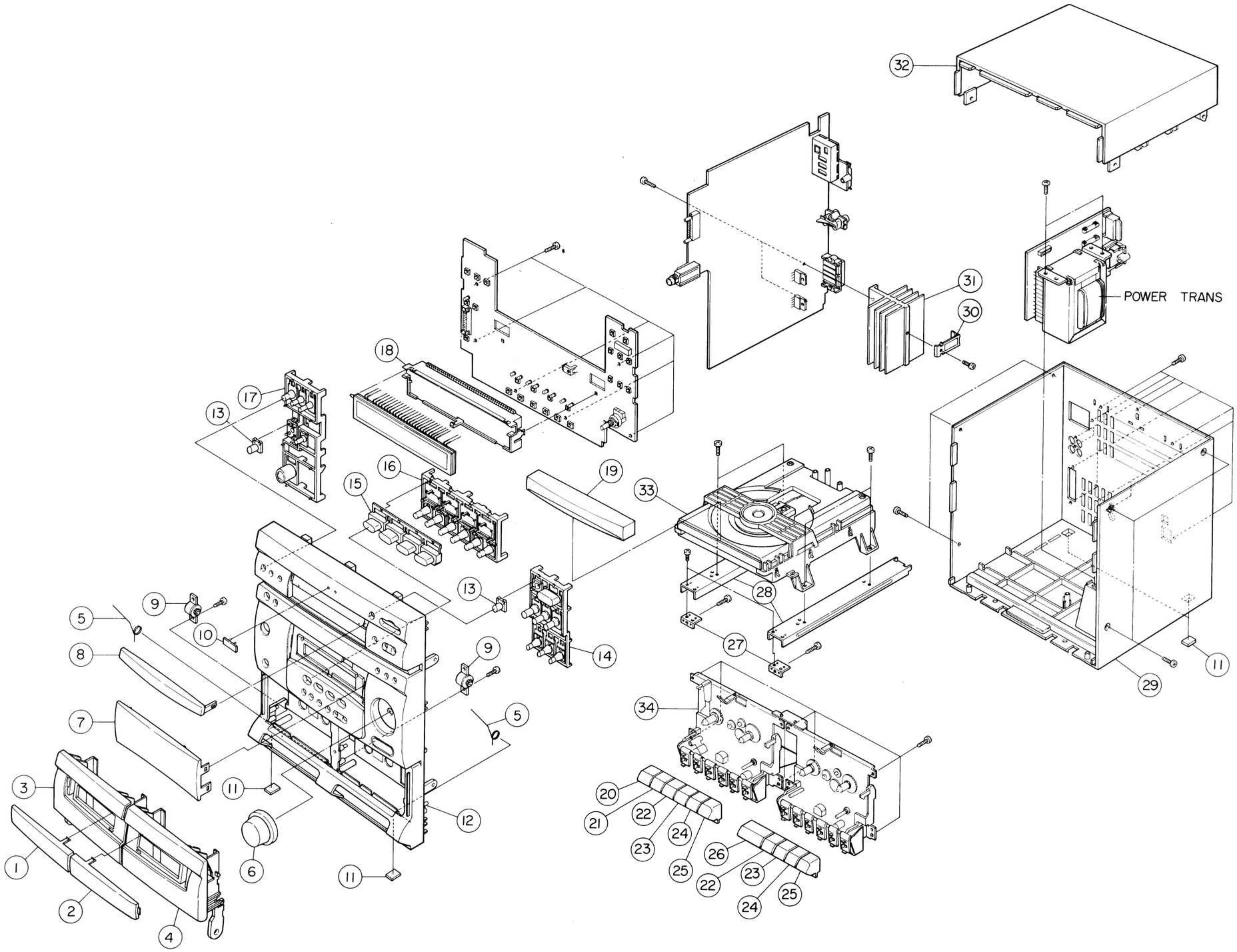
10-1. Main section

10-1-1. Parts list

● Exclutive part

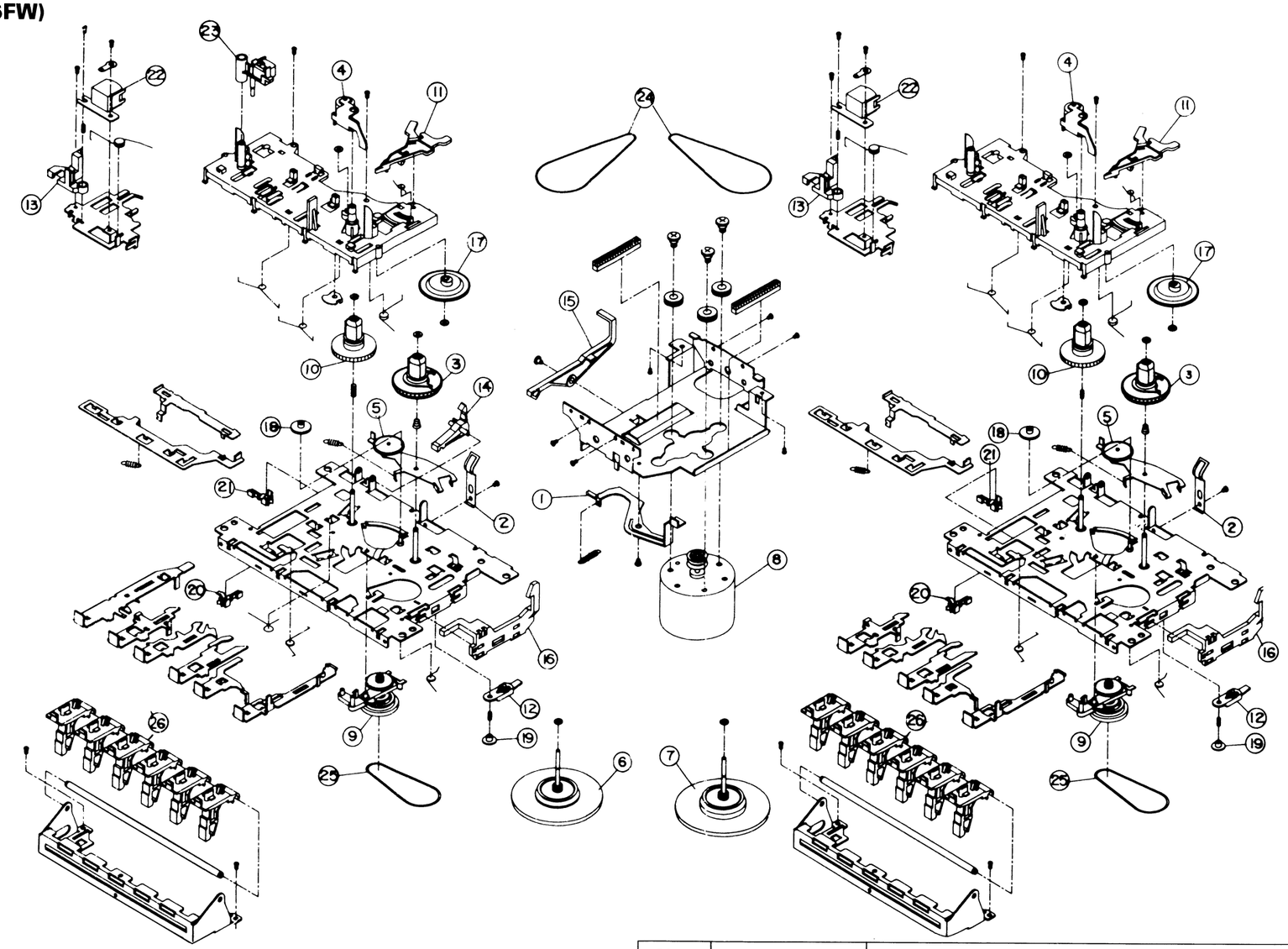
No.	Code no.	Description	Specification	Q'ty	Remark
1	14073-0258-00	WINDOW-DOOR(A)	MAX-440 SMOKE PMMA 1X2	1	●
2	14073-0259-00	WINDOW-DOOR(B)	MAX-440 SMOKE PMMA 1X2	1	●
3	14042-0137-02	DOOR-CASS(A)	MAX-440 EXP ABS BLK	1	●
4	14042-0138-02	DOOR-CASS(B)	MAX-440 EXP ABS BLK	1	●
5	16674-568-920	SPRING-DOOR	SUS PI0.9	2	
6	14084-0703-00	KNOB-VOLUME	MAX-440 BLK ABS 1X4	1	●
7	14073-0257-02	WINDOW(FL)	MAX-440 PMMA SMOKE EXP	1	●
8	14073-0260-00	WINDOW-DECO	MAX-440 SMOKE PMMA 1X2	1	●
9	15214-506-011	DAMPER-ASSY	POM PD790	2	
10	14534-0011-02	BADGE-BRAND	NEW SMASUNG AL L30	1	
11	13054-0044-00	CUSHION-FOOT	MQ570A T2.0 HH-38C	4	
12	12000-0274-02	CABINET-FRONT	MAX-440 BLK EXP MIPS	1	●
13	12714-0068-00	LENS(PLAY)	MAX-440 MILY PMMA 1X4	2	●
14	14082-0702-00	KNOB-PLAY	MAX-440 BLK ABS 1X2	1	●
15	12713-0067-02	LENS-FUNCTION	MAX-440 PMMMA MILKY EXP	1	●
16	14083-0709-00	KNOB-FUNCTION	MAX-440 BLK ABS 1X2	1	●
17	14082-0701-00	KNOB-POWER	MAX-440 BLK ABS 1X2	1	●
18	13322-0146-00	HOLDER-FLT	SCM7450 T2 BLK ABS 94HB	1	
19	14043-0139-02	DOOR-CD	MAX-440 EXP ABS BLK	1	●
20	14083-0705-02	KNOB-CASS(REC)	MAX-440 EXP ABS BLK	1	●
21	14083-0706-01	KNOB-CASS PLAY (A)	MAX-440 EXP ABS BLK	1	●
22	14083-0699-01	KNOB-CASS(F/F)	MAX-440 EXP ABS BLK	2	●
23	14083-0704-02	KNOB-CASS(REW)	MAX-440 EXP ABS BLK	2	●
24	14083-0700-01	KNOB-CASS(S/E)	MAX-440 EXP ABS BLK	2	●
25	14083-0707-02	KNOB-CASS(PAU)	MAX-440 EXP ABS BLK	2	●
26	14083-0708-01	KNOB-CASS PLAY(L)	MAX-440 EXP ABS BLK	1	●
27	13014-0272-00	BARCKET-CD	MAX-440 T1.0 SECC	2	●
28	12213-0017-00	FRAME-CD	MAX-440 T1.0 SECC	2	●
29	12000-0276-00	CABINET-BOTTOM	MAX-440 BLK MIPS 1X1	1	●
30	13013-0273-00	BRACKET-H/SINK	MAX-440 T1.0 SECC	1	●
31	11123-0057-00	HEAT-SINK	MAX-440 EXTR AL	1	●
32	12001-0275-00	CABINET-TOP	MAX-440 BLK MIPS 1X1	1	●

10-1-2. Exploded view (MAX-440)



10-2. Cassette deck exploded view & parts list

10-2-1. Exploded view (ADR2006FW)



10-2-2. Parts list

No.	Code no.	Description & Specification	Q'ty	Remark
	17159-0045-00	DECK-CASSETTE ; ADR2006 FW	1	
1	10000-607-186	LEVEL-SYNCHRO ; 11134-01280 AA	1	
2	10000-607-146	SP PACK ; 51299-02506XC	2	
3	10000-607-101	TAKE UP REEL ASSY ; ADR28-010	2	
4	10000-607-103	PINCH ARM ASSY ; ADR26-001	2	
5	10000-607-104	IDLER ARM ASSY ; ADR26-001	2	
6	10000-607-105	FLYWHEEL GEAR S ASSY ; ADR15-021	1	
7	10000-607-106	FLYWHEEL GEAR D ASSY ; ADR15-022	1	
8	10000-502-020	MOTOR ; EG530YD2B	1	
9	10000-607-108	FR ARM ASSY	2	
10	10000-607-109	SUPPLY REEL GEAR ASSY	2	
11	10000-607-117	ARM-SENSOR 11102-00530AA	2	
12	10000-607-111	PAUSE LOCK CAM	2	
13	10000-607-113	HEAD BASE M	2	
14	10000-607-145	LEVEL REC SAFETY ; 11134-01000AA	1	
15	10000-607-184	LEVEL-RELEASE ; 11134-01240AA	1	
16	10000-607-160	LEVEL EJECT(F) ; 11134-01220AA	2	
17	10000-607-114	CAM GEAR	2	
18	10000-607-115	F.F GEAR ; 11128-00055AA	2	
19	10000-607-116	PAUSE CAP ; 11116-00011AA	2	
20	10000-607-178	LEAF SW(MAIN) ; MSW1541 X ACV	2	
21	10000-607-179	LEAF SW(REC)MSW1716CV	1	
22	10000-523-008	R/P HEAD ; MS15R-AA2N1	2	
23	10000-607-162	ARM-MAGNETIC ; 11102-00520AA	1	
24	10000-607-159	BELT MAIN ; 59.7PI X 1.0T	2	
25	10000-607-156	BELT SUB ; 34.7 PI X 1.0T	2	
26	10000-607-128	BUTTON KNOB ; 11133-00010AA	12	

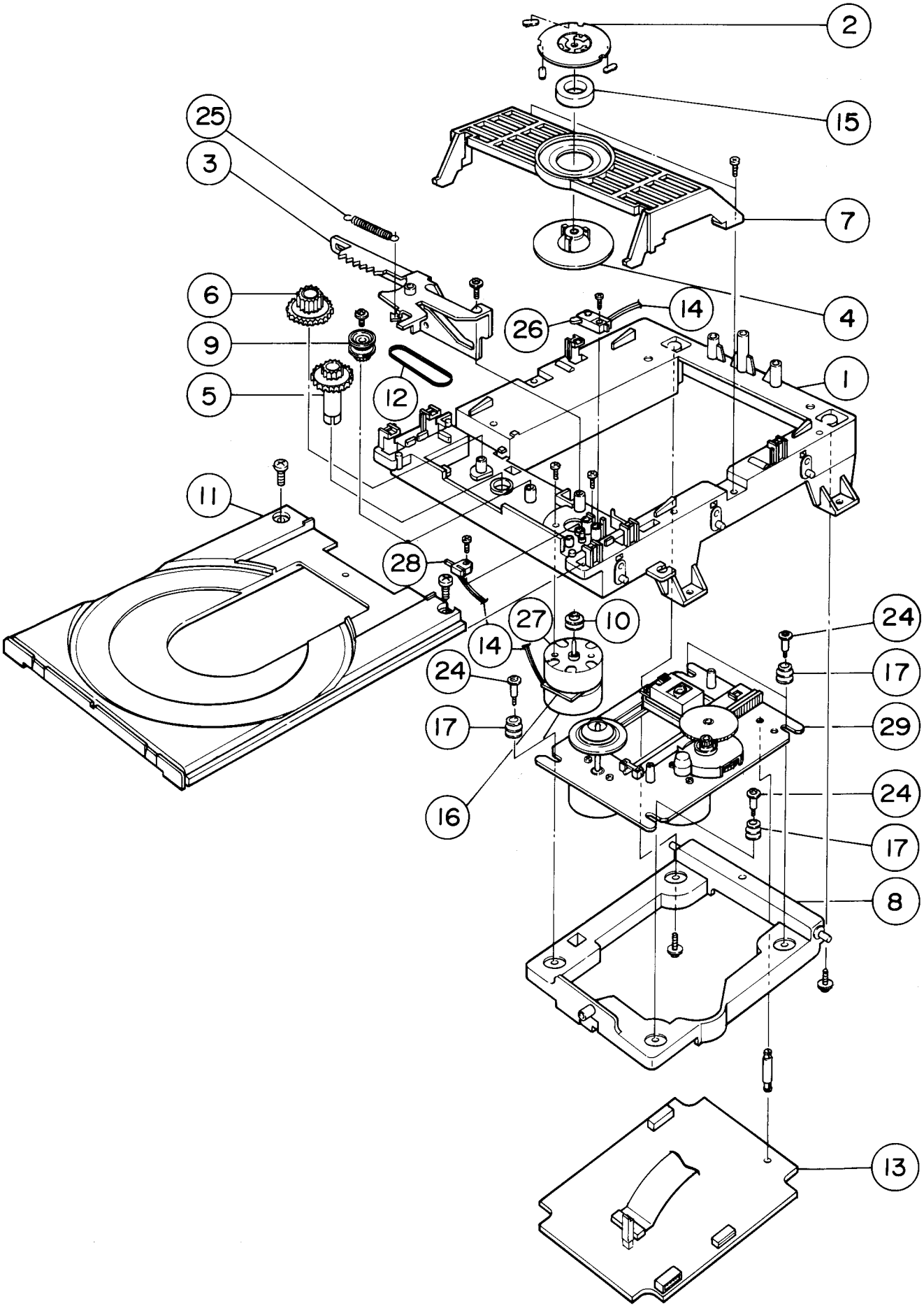
10-3. CD MECHA exploded view & parts list

10-3-1. CD MECHA parts list(CMS-P3M6U)

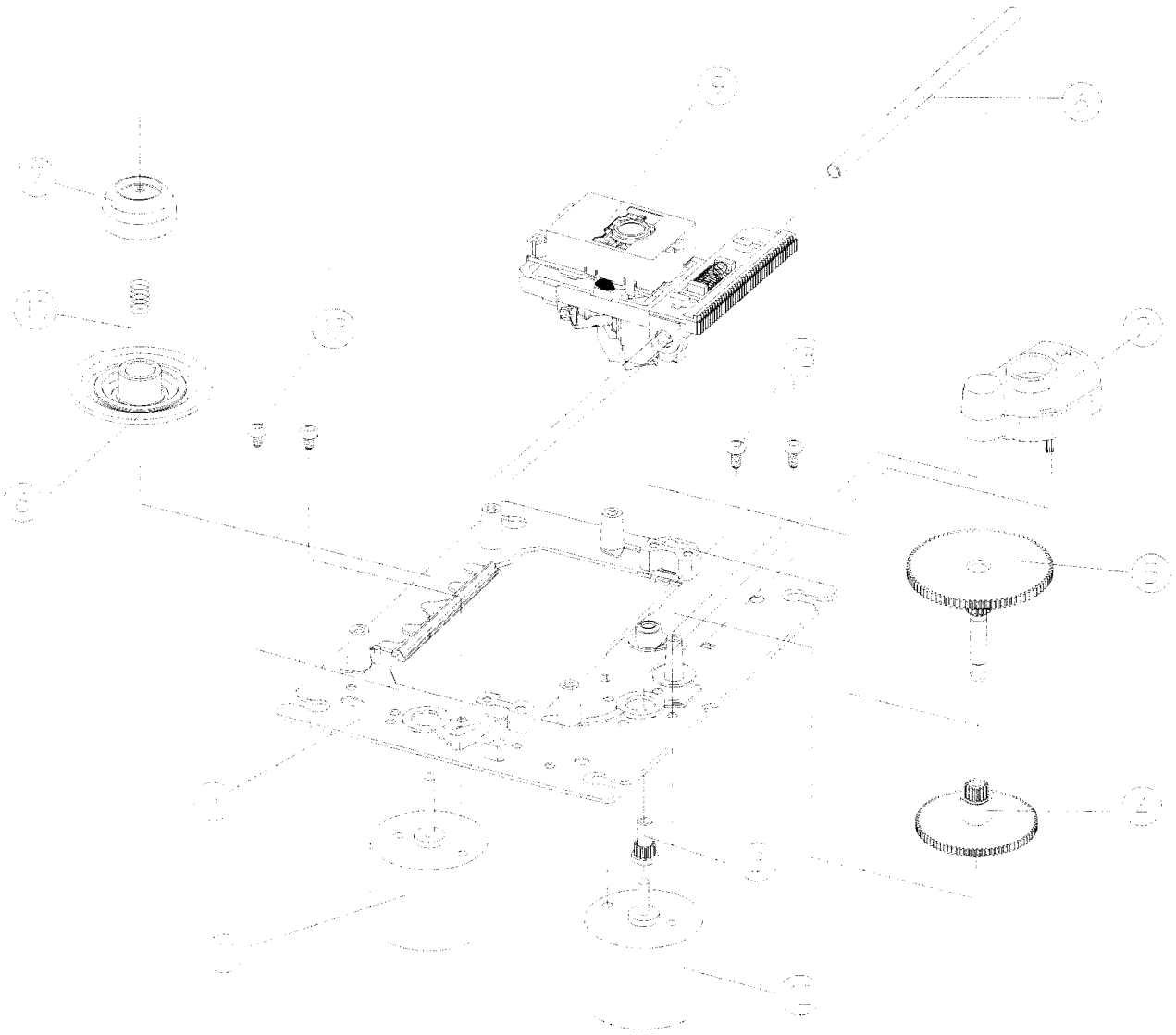
No.	Code no.	Description & Specification	Q'ty	Remark
1	12201-0013-00	BASE-MAIN; ABS BLK	1	
2	13014-0119-00	BRACKET-CHUCK ; CMS-CR1 T0.8 WHT SECC	1	
3	11583-0001-00	CAM; PC BLK CMS-M1	1	
4	12223-0015-00	TABLE-CHUCK; CMS-CR3 T6.7 POM(90-02)	1	
5	11474-0006-00	GEAR(A) ; NYLON12 M0.5/M0.5 Z17/Z45 SP NTR CMS-M1	1	
6	11474-0007-00	GEAR(B) ; POM M0.5/M0.8 Z19/Z46 SP BLK CMS-M1	1	
7	13329-0013-00	HOLDER-CHUCK; ABS BLK CMS-M1	1	
8	11532-0004-00	LEVER-LIFTER DECK ; ABS BLK CMS-M1	1	
9	11504-0001-00	PULLEY-GEAR ; POM D12/M0.51 Z17 SP BLK CMS-M1	1	
10	11504-0002-00	PULLEY-MOTOR ; POM D4 BLK CMS-M1	1	
11	13602-0001-00	TRAY-M1 ; ABS BLK CMS-M1	1	
12	11494-0001-00	BELT-PULLEY ; NEOPLEN FR W1.5 T1.5/78.8 CMS-CR1	1	
13	19129-0357-01	ASS'Y CD PCB ; G3A8 1-CD	1	
14	13070-046-125	CONNECTOR-WIRE,BN ; 51004-06P/51004-06P 1007#28 350	1	
15	14014-500-600	MAGNET-CHUCK ; FERRITE 6P 250+ -20G	1	
16	16024-0083-00	PCB-MOTOR ; FR-1 T1.6 W109 L113 CMS-M1	1	
17	16174-503-411	RUBBER-CD; SI RUBBER BLU CMS-M5M6C	1	
24	15104-531-710	SHAFT-CD; FE FZY 2.6X10.5	1	
25	12724-0010-00	SPRING-CAM; STSW PI0.2 D3.2 CMS-CR1	1	
26	B3022-0004	SWITCH-LEAF ; MLS-1 DC 1.6V 1A	1	
27	B3070-0002	MOTOR-DC ; RF-500TB 9V	1	
28	13573-901-050	SWITCH-MICRO ; SPPB-11 SCDR-200	1	
29	*CMS-A30NM6	DECK-CD ;CMSA30NM6	1	

- Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

10-3-2. CD MECHA Exploded view (CMS-P3M6U)



10-3-3. CD deck exploded view(CMSP30NM6)

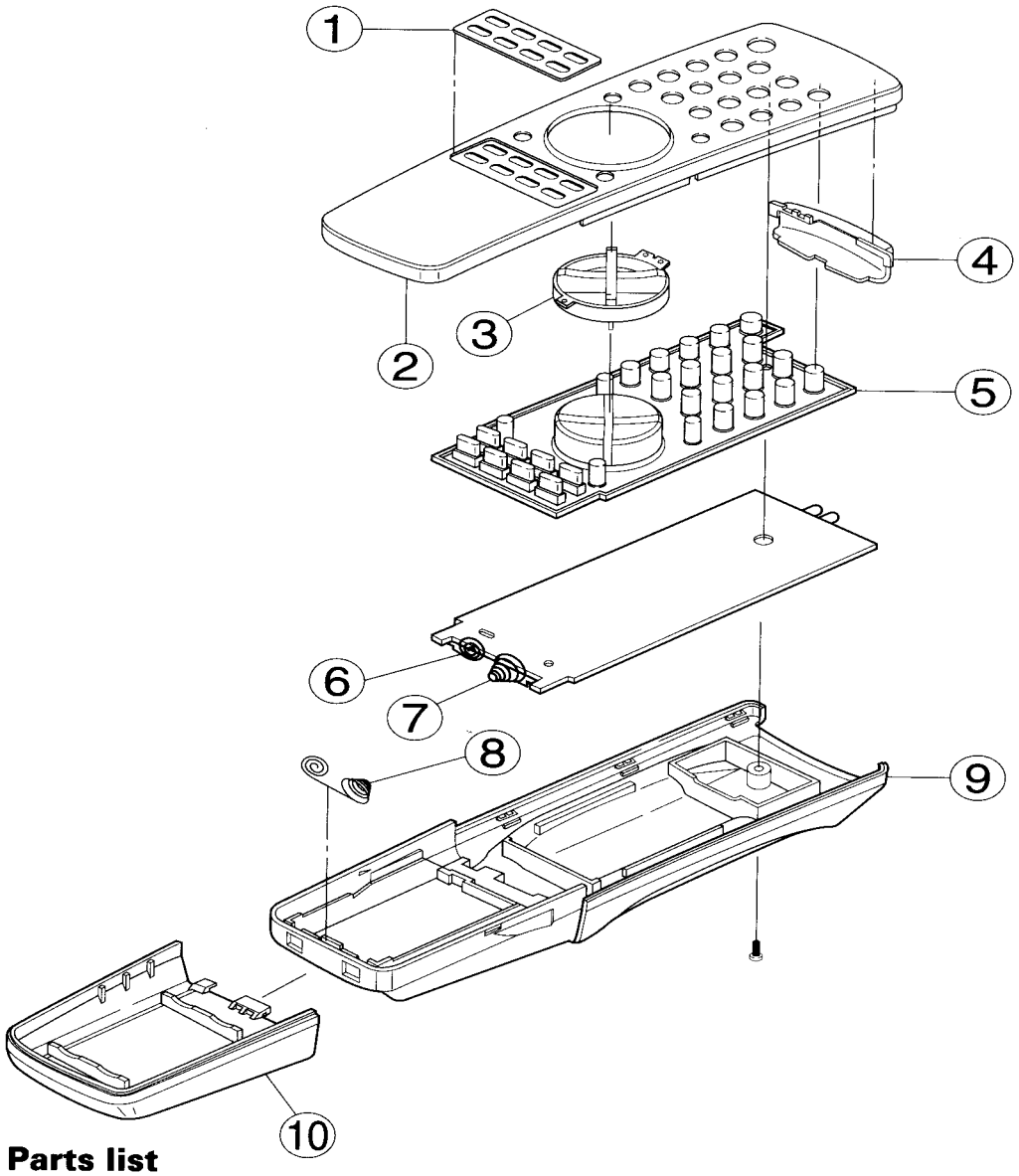


10-3-4. Parts list

No.	Code no.	Description	Specification	Q'ty	Remark
	CMSP30NM6	DECK -CD	BASIC	1	
1	12201-0052-02	CHASSIS-DECK(M)	CMSA30 POM M90-44	1	
2	13313-0057-00	COVER-GEAR	CMS-V30 BLK ABS	1	
3	11474-0017-00	GEAR(A)	CMS-V30 M0.3 Z13 SP POM	1	
4	11474-0018-00	GEAR(B)	CMS-V30 M0.3 Z13 SP POM	1	
5	11474-0019-00	GEAR(C)	CMS-V30 M0.3 Z16/Z90 SP POM	1	
6	11404-0041-00	SHAFT-PU	CMS-V30 D3 L79 SUS420J2	1	
7	15253-503-011	CENTER-RING	ABS+GS 20% CMS-V10N	1	
8	12223-0003-00	TURN-TABLE(M)	ABS+GS 20% CMS-V10N	1	
9	*SOH-AP	PICK-UP CDP	P/U SOH-A1 ROW V-P/J	1	
10	12724-0062-00	SPRING-T/TABLE	CS STS-W PI0.4 D5.7 L9.3 CMS-V10N	1	
11	16829-0004-00	MOTOR-SPINDLE	RF-310T-11400 43L 25V 85mA	1	
12	14769-057-250	MOTOR-FEED	RF-310TA 30MM NDM4RA3ETL 11.0MM	1	
13	17008-120-032	SCREW-PH(+M2*3)	+M2X3 FE FZY W700	1	

10-4. Remote control

10-4-1. Exploded view

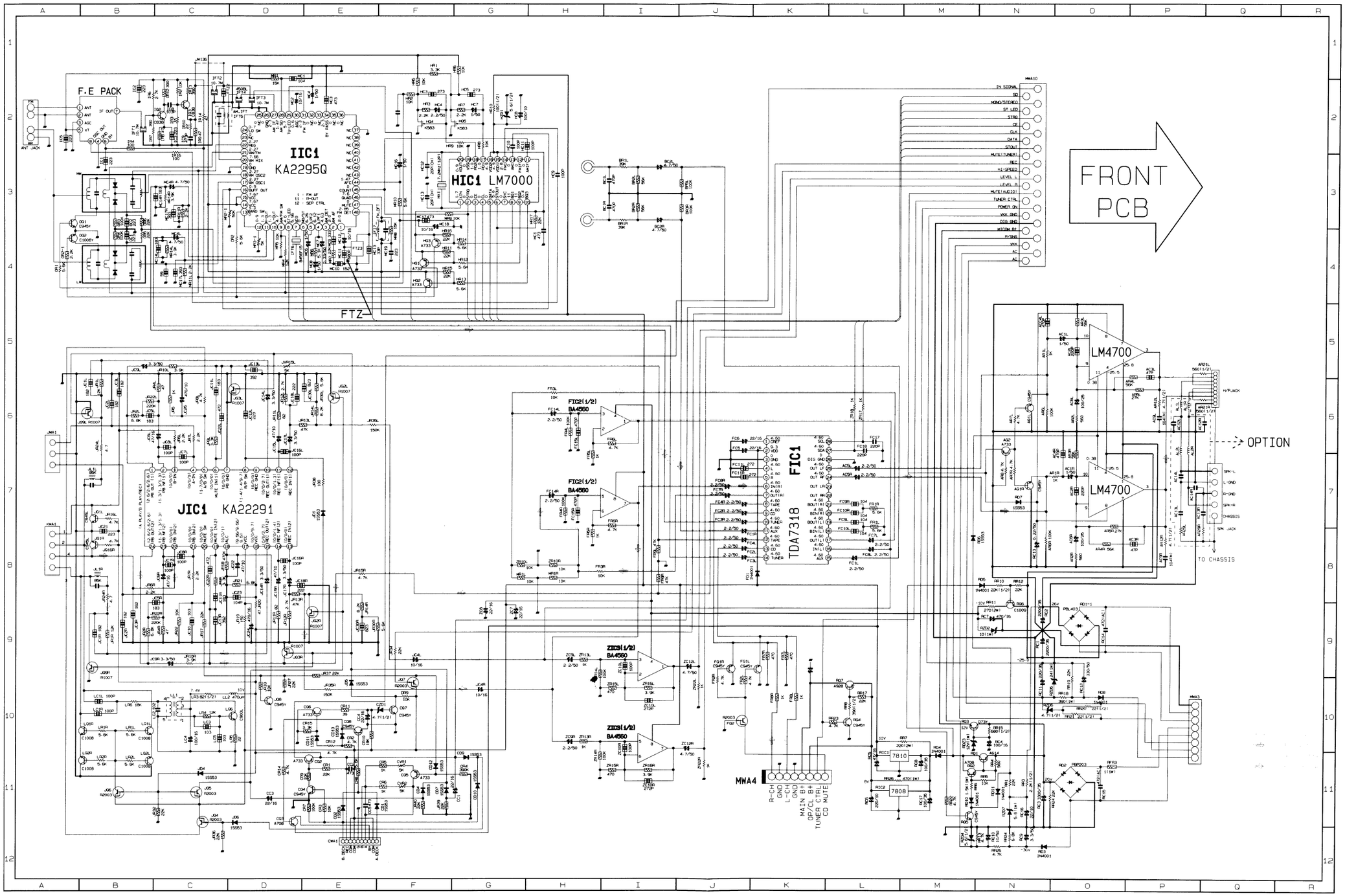


10-4-2. Parts list

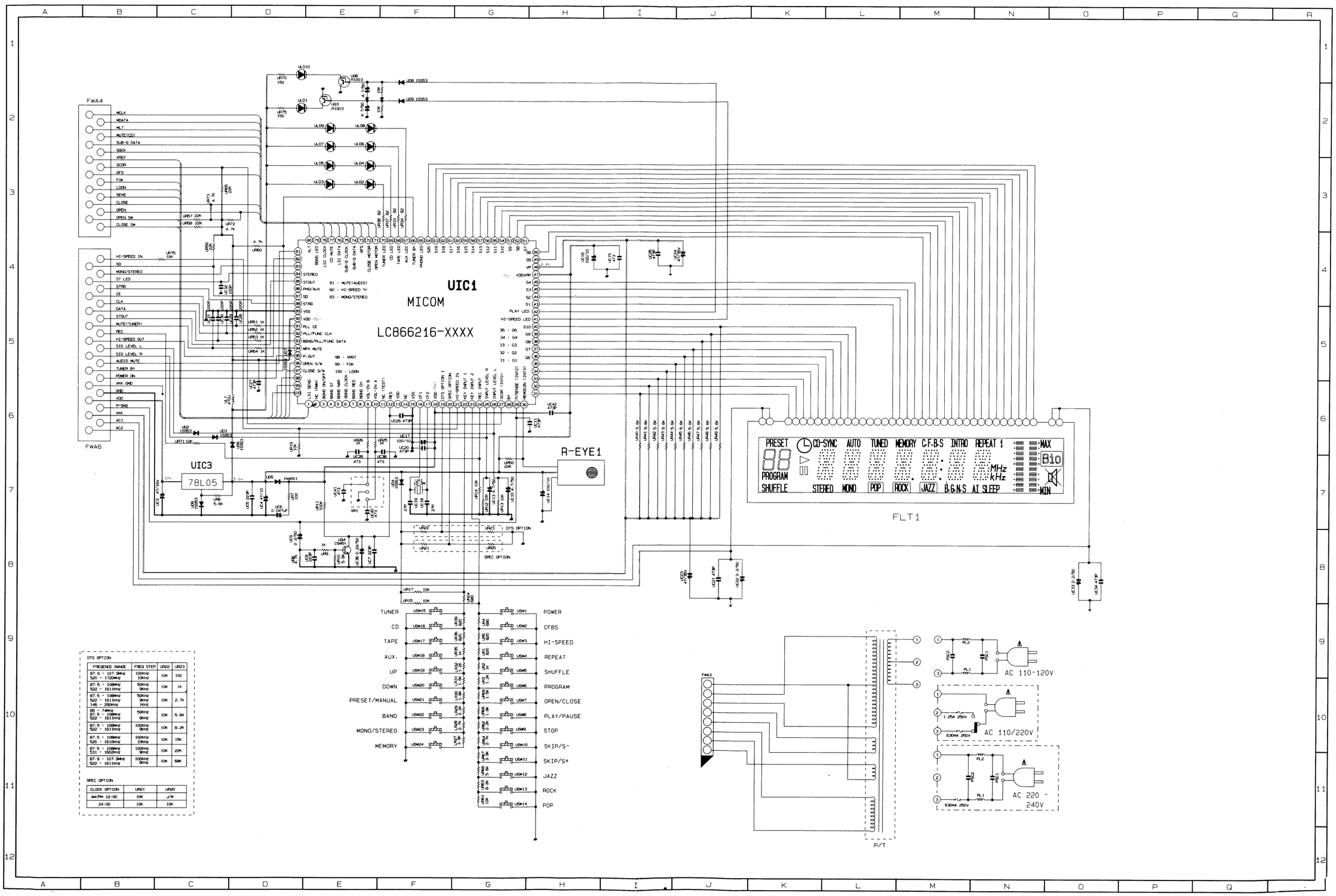
No.	Code no.	Description	Specification	Q'ty	Remark
	19239-0042-00	ASS'Y REMOCON	MAX-440 EXP	1	
1	14014-0033-02	INLAY-REMOCON	MAX440 REMOCON T0.5 PC	1	
2	12001-0283-02	CABINET-TOP	MAX440 REMOCON ABS 94HB	1	
3	13353-0043-00	GUIDE-KNOB	MQ-555 REMOCON ABS 94HB	1	
4	14073-0235-00	WINDOW-REMOCON	RCD1650/EXP PC	1	
5	14082-0765-02	KNOB-RUBBER	MAX440 REMOCON SILICON	1	
6	12724-0189-00	SPRING-A(+)	MM-77 STS PI0.6 NI-CO	1	
7	12724-0190-00	SPRING-B(-)	MM-77 STS PI0.6 CS	1	
8	12724-0191-00	SPRING-C	MM-77 STS304 PI0.6 CS	1	
9	12001-0249-00	CABINET-BOTTOM	RCD1650/EXP REMOCON ABS 94HB	1	
10	14043-0126-00	DOOR-BATTERY	RCD1650/EXP REMOCON ABS 94HB	1	
	11449-518-101	CONDENSER AXIAL-LEAD	50V UP050	2	
	12149-401-150	TRANSISTOR	KSD 471-Y, TAPE	1	
	14539-504-030	CERAMIC-RESONATOR	CSB4545EBL	1	

11. Schematic diagram

11-1. Main section



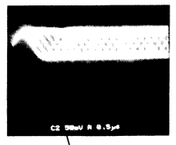
11-2. Front section

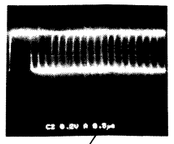


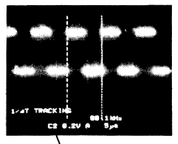
DTS OPTION			
FREQENCE RANGE	FREQ STEP	UR22	UR23
87.9 ~ 107.9MHz 520 ~ 1720KHz	100KHz 10KHz	10K	100
87.5 ~ 108MHz 522 ~ 1611KHz	50KHz 9KHz	10K	1K
87.5 ~ 108MHz 522 ~ 1611KHz 146 ~ 290KHz	50KHz 9KHz 1KHz	10K	2.7K
65 ~ 74MHz 87.5 ~ 108MHz 522 ~ 1611KHz	50KHz 50KHz 9KHz	10K	5.6K
87.5 ~ 108MHz 522 ~ 1611KHz	100KHz 9KHz	10K	8.2K
87.5 ~ 108MHz 520 ~ 1610KHz	100KHz 10KHz	10K	15K
87.5 ~ 108MHz 531 ~ 1602KHz	100KHz 9KHz	10K	22K
87.9 ~ 107.9MHz 522 ~ 1611KHz	100KHz 9KHz	10K	68K

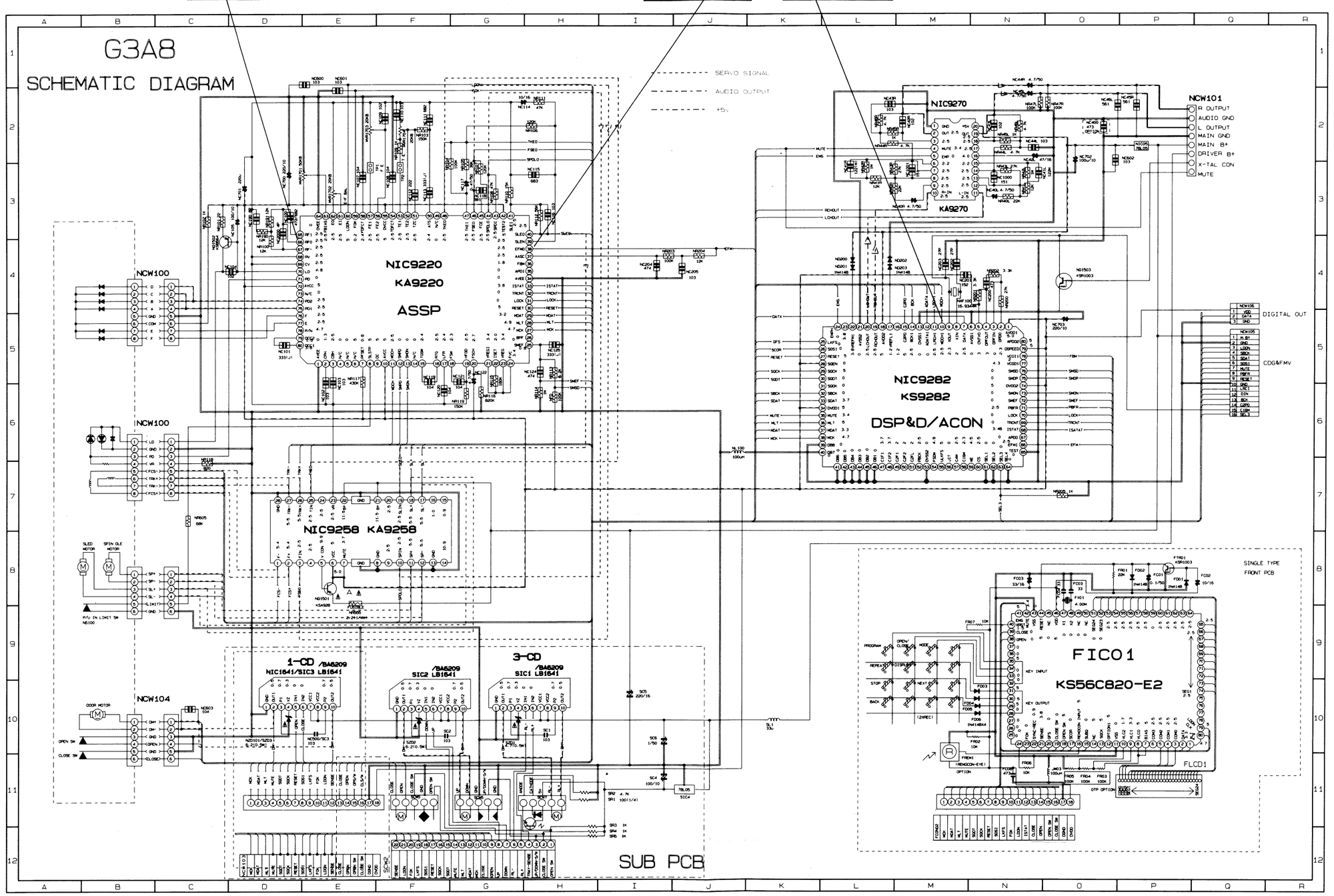
SPEC OPTION		
CLOCK OPTION	UR21	UR20
AM/FM 12-00	10K	J/W
24:00	10K	10K

11-3. CD section



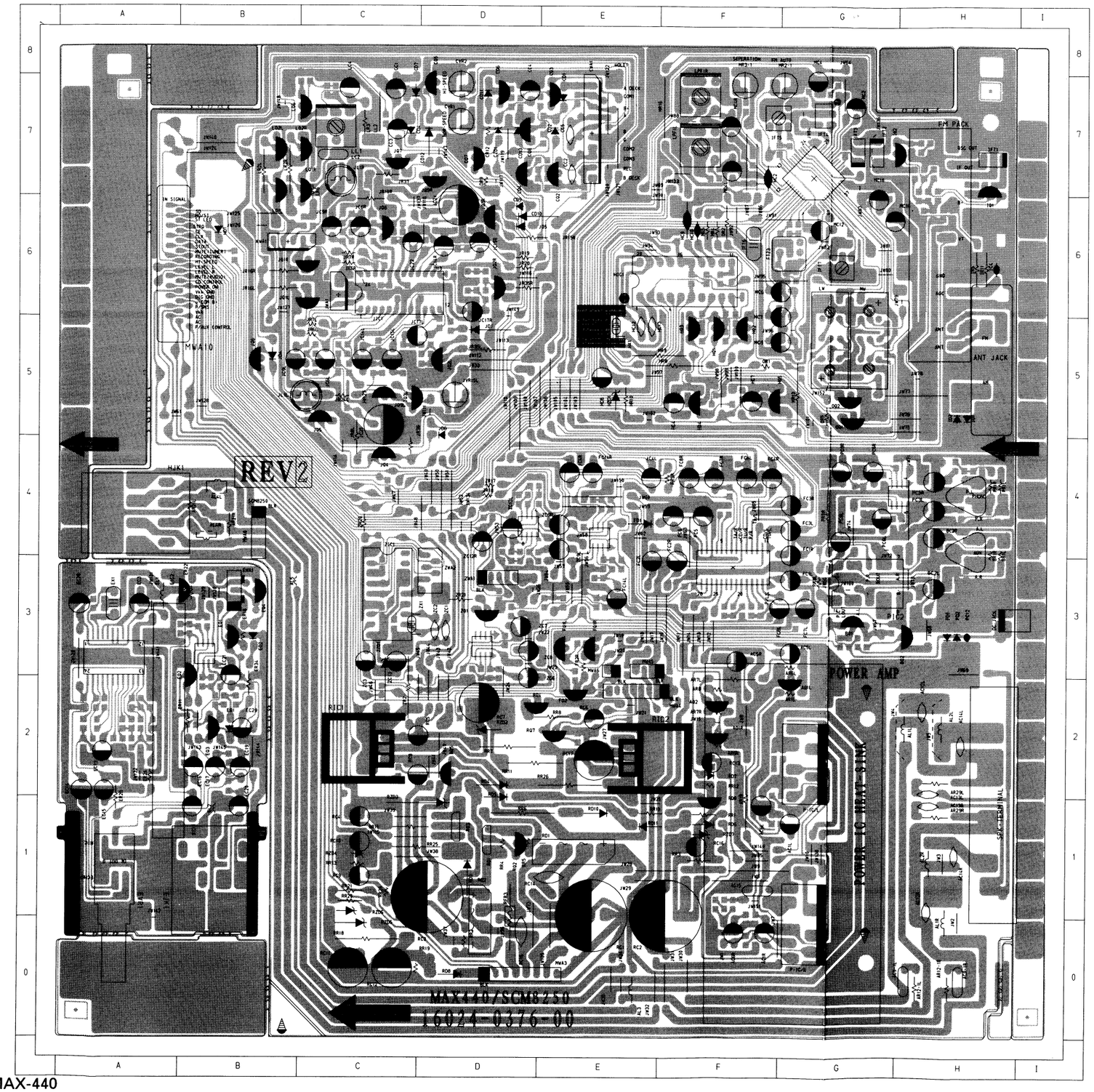






12. PCB Pattern and Marking diagram

12-1. Main section



XXX DIODE XXX

CD1 (E7)
CD10 (D6)
CD11 (D7)
CD12 (D7)
CD13 (D7)
CD2 (E7)
CD4 (C7)
CD7 (C7)
CD9 (D6)
CZD1 (D7)
ED1 (B2)
ED2 (B3)
FD1 (F4)
HD1 (B6)
HZD1 (E5)
ID1 (H5)
ID2 (H5)
JD1 (D5)
JD4 (B5)
JD5 (D6)
JD6 (D5)
PD1 (H3)
PD2 (H3)
RD10 (E1)
RD11 (E1)
RD3 (D1)
RD4 (D2)
RD5 (D2)
RD6 (F1)
RD7 (F2)
RD8 (D0)
RZD2 (D2)
RZD3 (D1)
RZD4 (C1)
RZD5 (C0)
RZD6 (C1)
RZD7 (F1)
ZZD1 (C3)

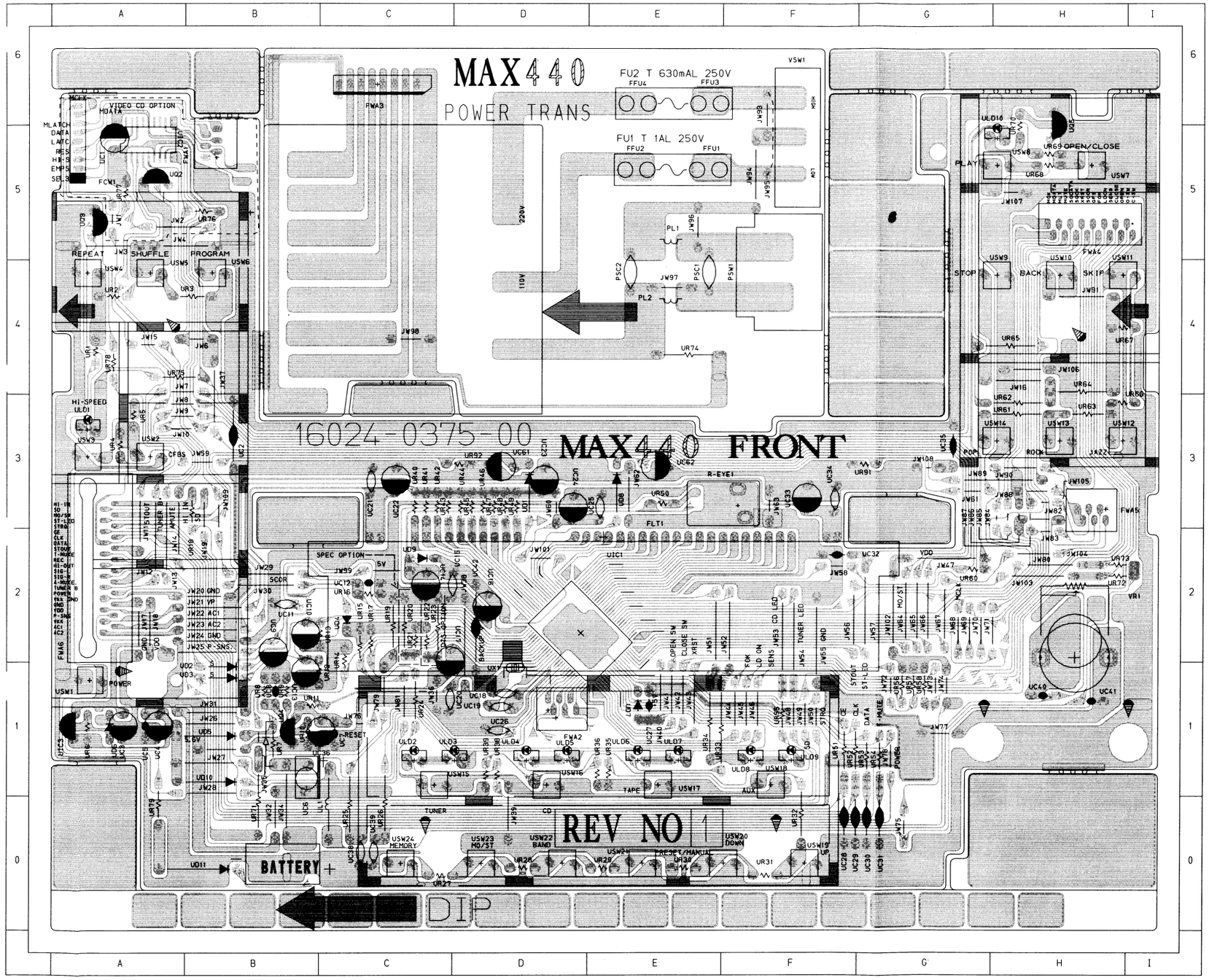
XXX TR XXX

AQ1L (G2)
AQ1R (F2)
AQ2 (F2)
BQ1 (G3)
BQ2 (H3)
CQ2 (E7)
CQ3 (E7)
CQ4 (D7)
CQ5 (D7)
CQ6 (D7)
CQ7 (D7)
CQ8 (D7)
EIC2 (B3)
EQ1 (B3)
EQ2 (B3)
EQ3 (B2)
EQ4 (B3)
FQ1L (E3)
FQ1R (E3)
FQ2 (E2)
HQ1 (F5)
HQ2 (F5)
HQ3 (F5)
HQ4 (F5)
HQ5 (F5)
IQ1 (H7)
IQ2 (G7)
JQ1L (C6)
JQ1R (C6)
JQ2L (D5)
JQ2R (D6)
JQ3L (C5)
JQ3R (D6)
JQ4 (C4)
JQ5 (C5)
JQ6 (B5)
JQ7 (C7)
JQ8 (C6)
JQ9L (C5)
JQ9R (D7)
LQ1L (B7)
LQ1R (C7)
LQ2L (B7)
LQ2R (C7)
LQ6 (C7)
OQ1 (G5)
OQ2 (G5)
RQ1 (D1)
RQ2 (D1)
RQ3 (D1)
RQ4 (E2)
RQ5 (D2)
RQ6 (F2)
RQ7 (E2)
ZQ1 (D3)

XXX IC&WAFER XXX

B DECK (E7)
DC JACK (H3)
EWA1 (B3)
IFT4 (G7)
IFT5 (F7)
IFT7 (G6)
IIC1 (G7)
JWA1 (C6)
KWA1 (B6)
MWA3 (D0)
MWA4 (E2)
MWA5 (E3)
MWA6 (E3)
MWA8 (B4)
ZWA1 (D3)

12-2. Front section



*** DIODE ***

UD1 (D3)
UD10 (B1)
UD11 (B0)
UD2 (B1)
UD3 (B1)
UD4 (C2)
UD5 (B1)
UD6 (A1)
UD7 (E1)
UD8 (E3)
UD9 (C2)

*** TR ***

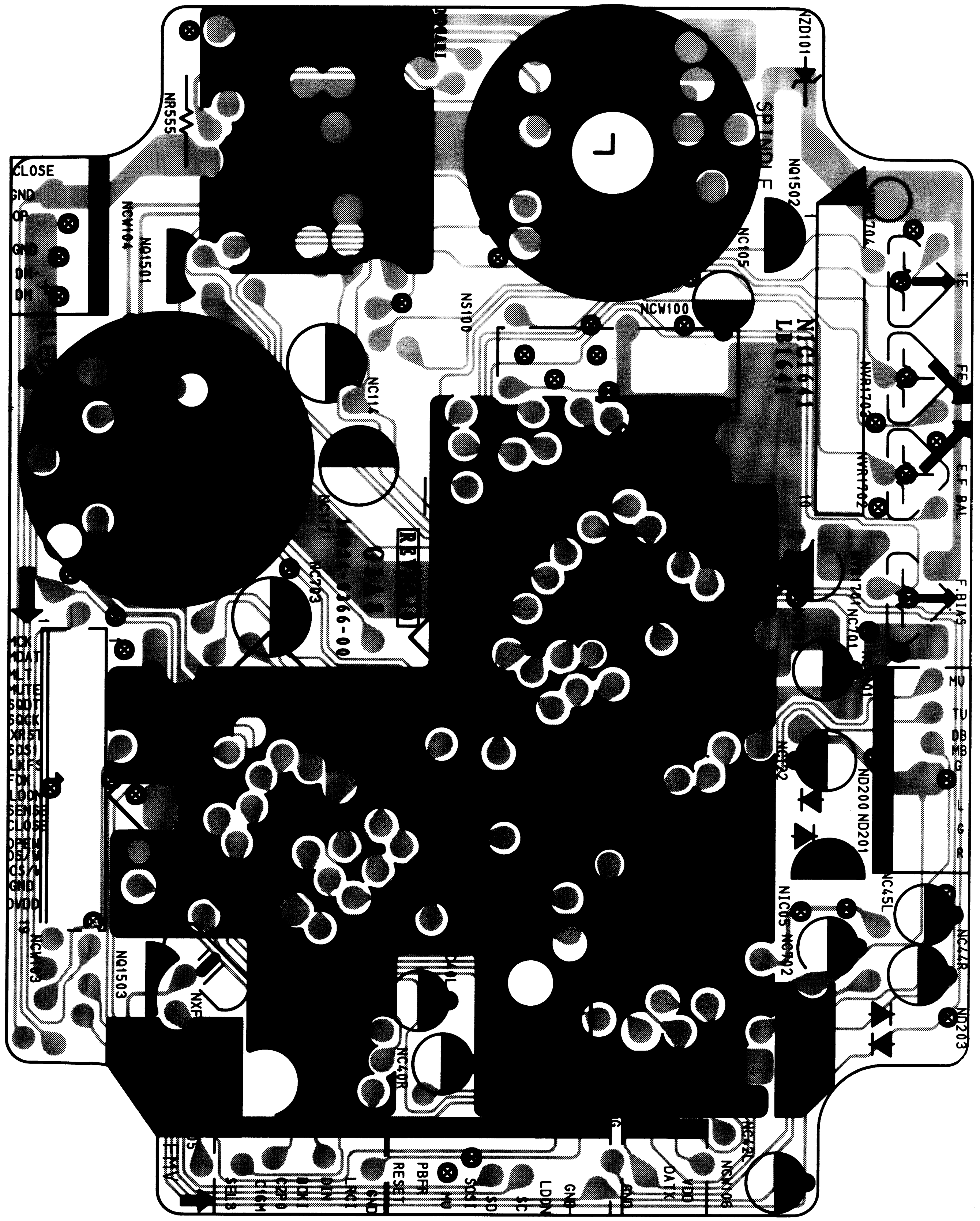
UIC3 (A1)
UQ2 (A5)
UQ3 (A5)
UQ4 (B1)
UQ5 (H6)

*** IC&WAFER ***

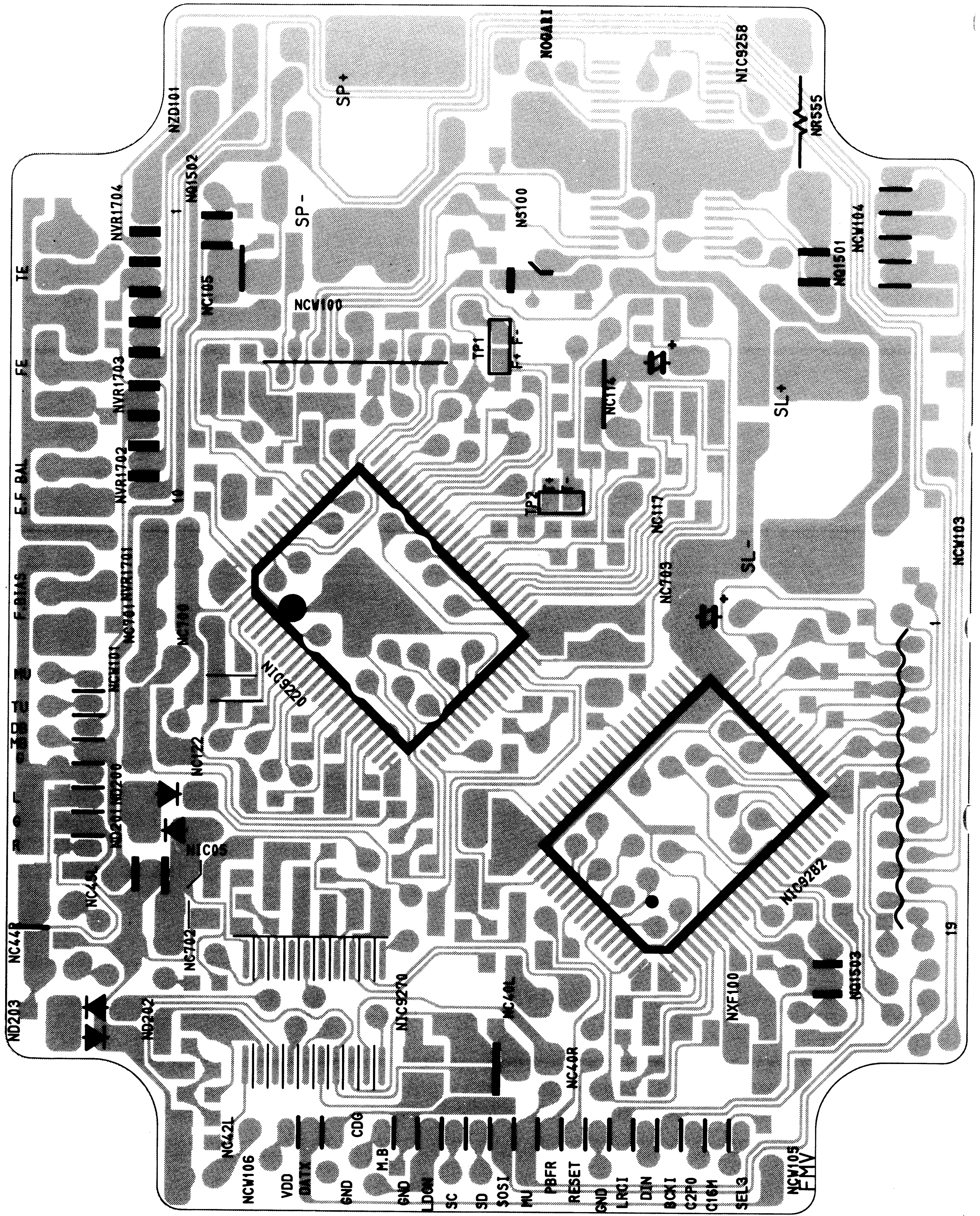
FCW1 (A5)
FWA3 (C6)
USW1 (A1)
USW10 (H4)
USW11 (H4)
USW12 (H3)
USW13 (H3)
USW14 (H3)
USW15 (C1)
USW16 (D1)
USW17 (E1)
USW18 (F1)
USW19 (F0)
USW2 (A3)
USW20 (F0)
USW21 (E0)
USW22 (D0)
USW23 (D0)
USW24 (C0)
USW3 (A3)
USW4 (A4)
USW5 (A4)
USW6 (B4)
USW7 (H5)
USW8 (H5)
USW9 (H4)
VSW1 (F5)

12-3. CD section

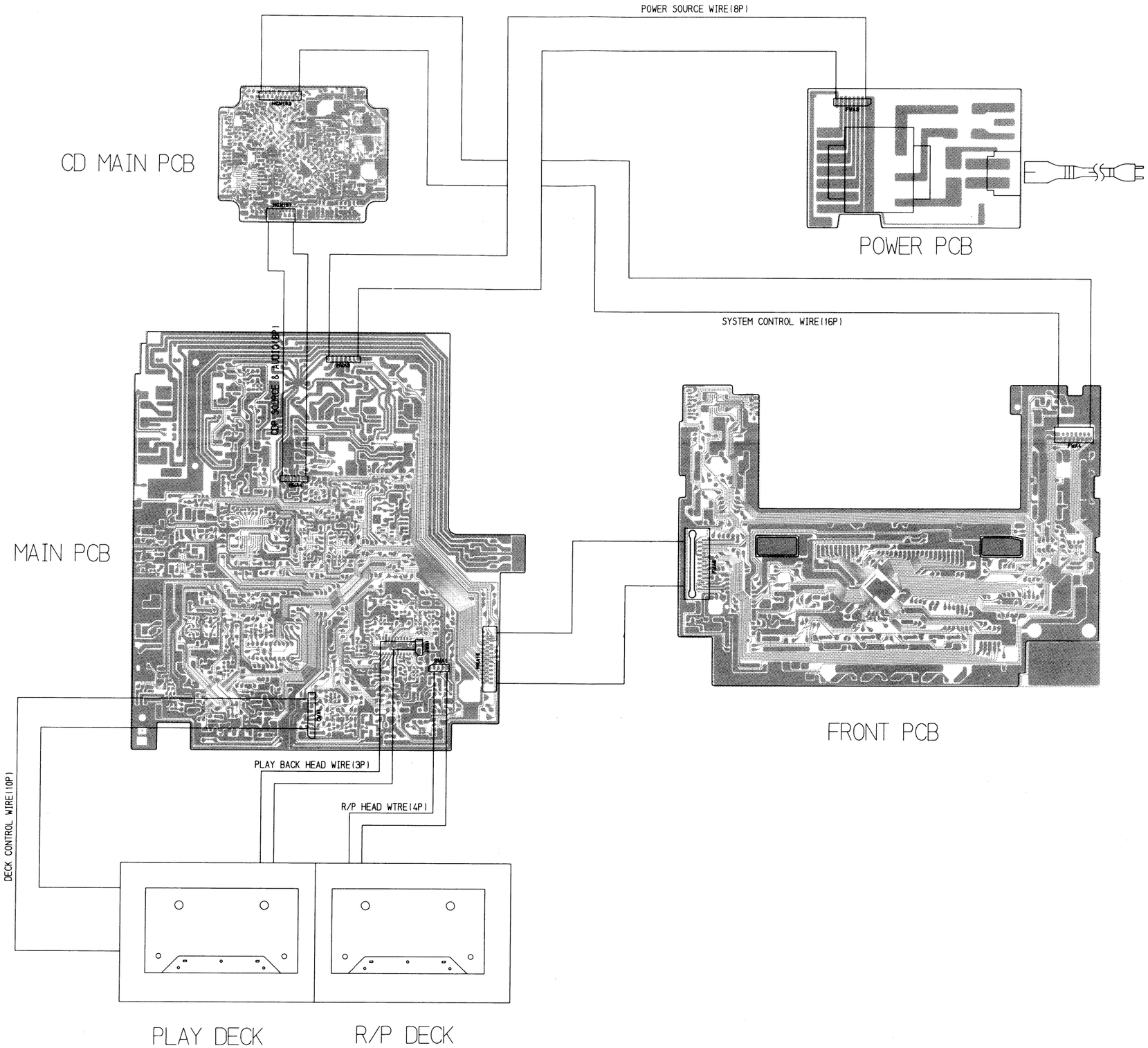
12-3-1. Front part


NZD101
NR555
SPINDLE
NQ1502
NC105
NCW100
NIC1641
LB1641
CLOSE
GND
OP
GND
DM-
DM+
NCW104
NQ1501
NS100
NC114
NC117
NC703
F.BIAS
TE
FE
E.F BAL
NVR1703
NVR1702
NVR1701
NC701
MU
TU
DB
MB
G
L
G
R
ND200 ND201
NC45L
NIC05
NQ902
NC44R
ND203
NQ1503
NC40R
NCW103
SEL3
C16M
C2P0
BCKI
DIN
LRCI
GND
RESET
PBFR
MU
SOSI
SD
SC
LDDN
GND
DATX
VDD
NCW106
NC42L

12-3-2. Bottom part


NZD101
NQ1502
NVR1704
SP+
SP-
NS100
NIC9258
NR555
NQ1501
NCW104
NC105
NCW100
TP1
TE
FE
NVR1703
NC114
SL+
E.F BAL
NVR1702
TP2
NC117
NCW103
F.BIAS
NVR1701
NC701
NC703
SL-
NIC9220
MU
TU
DB
NC122
ND201 ND200
NIC05
NC45L
NC44R
NC702
NIC9282
ND203
ND202
NIC9270
NC40L
NXF100
NQ1503
NC40R
NC42L
NCW106
VDD
DATX
GND
CDG
M.B
GND
LDON
SC
SD
SOSI
MU
PBFR
RESET
GND
LRCI
DIN
BCKI
C2P0
C16M
SEL3
NCW105
FMV

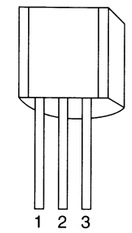
13. Wiring diagram



14. IC & TR internal diagram

14-1. Main section

• TR

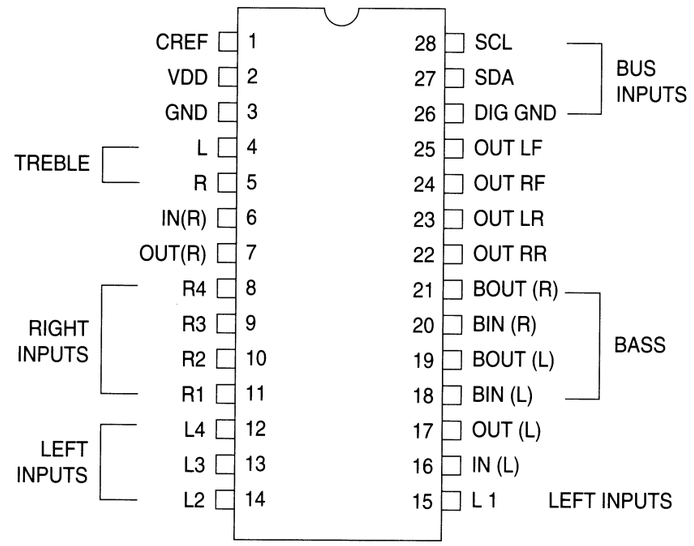


NAME \ NO.	1	2	3
KC7808 KC7810	IN	GND	OUT
KSD73-Y KSA 614-Y	B	C	E
KSA708-Y KSA733-Y KSC838-O KSC900-L KSC945-Y KSC1008-Y KSC1009-Y	E	B	C
KSA928 KSR1007 KSR2003	E	C	B
KSK583	D	S	G

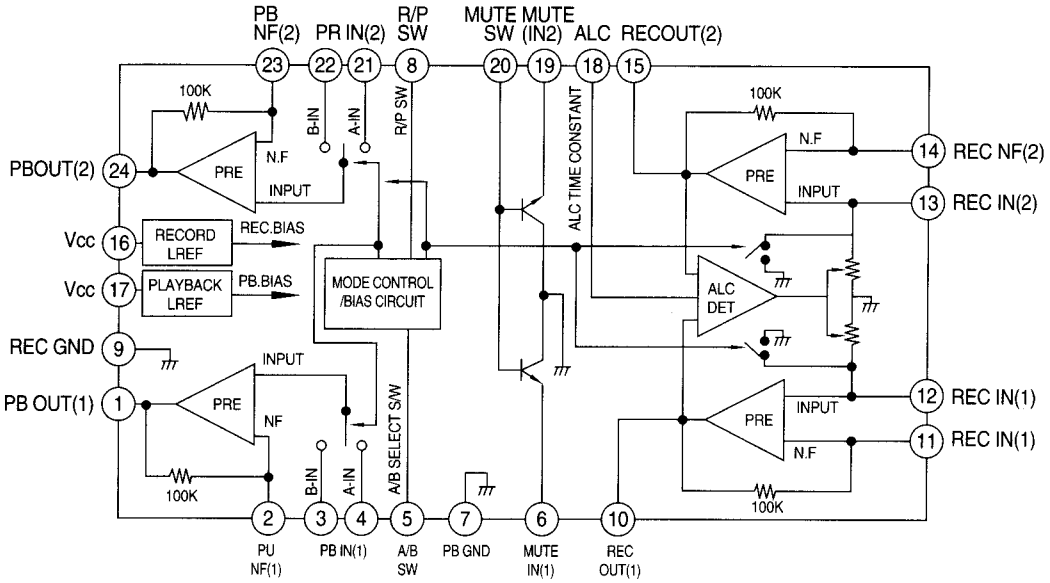
* NOTE : In this page

S : Source
D : Drain
G : Gate

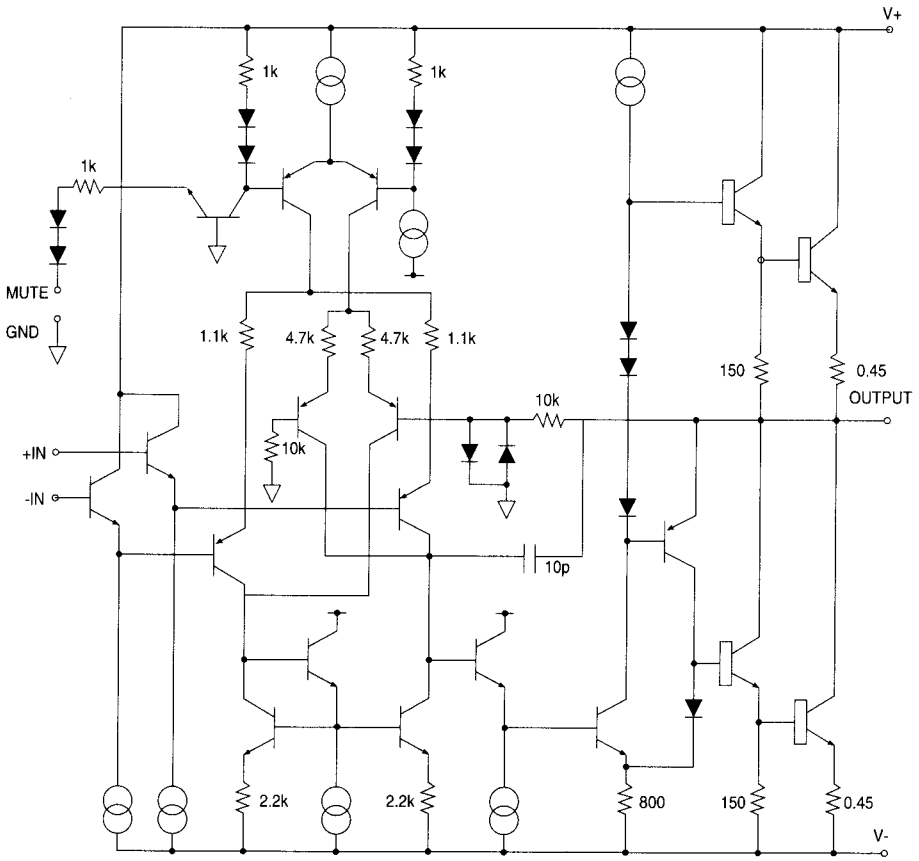
• TDA7318 : FIC1



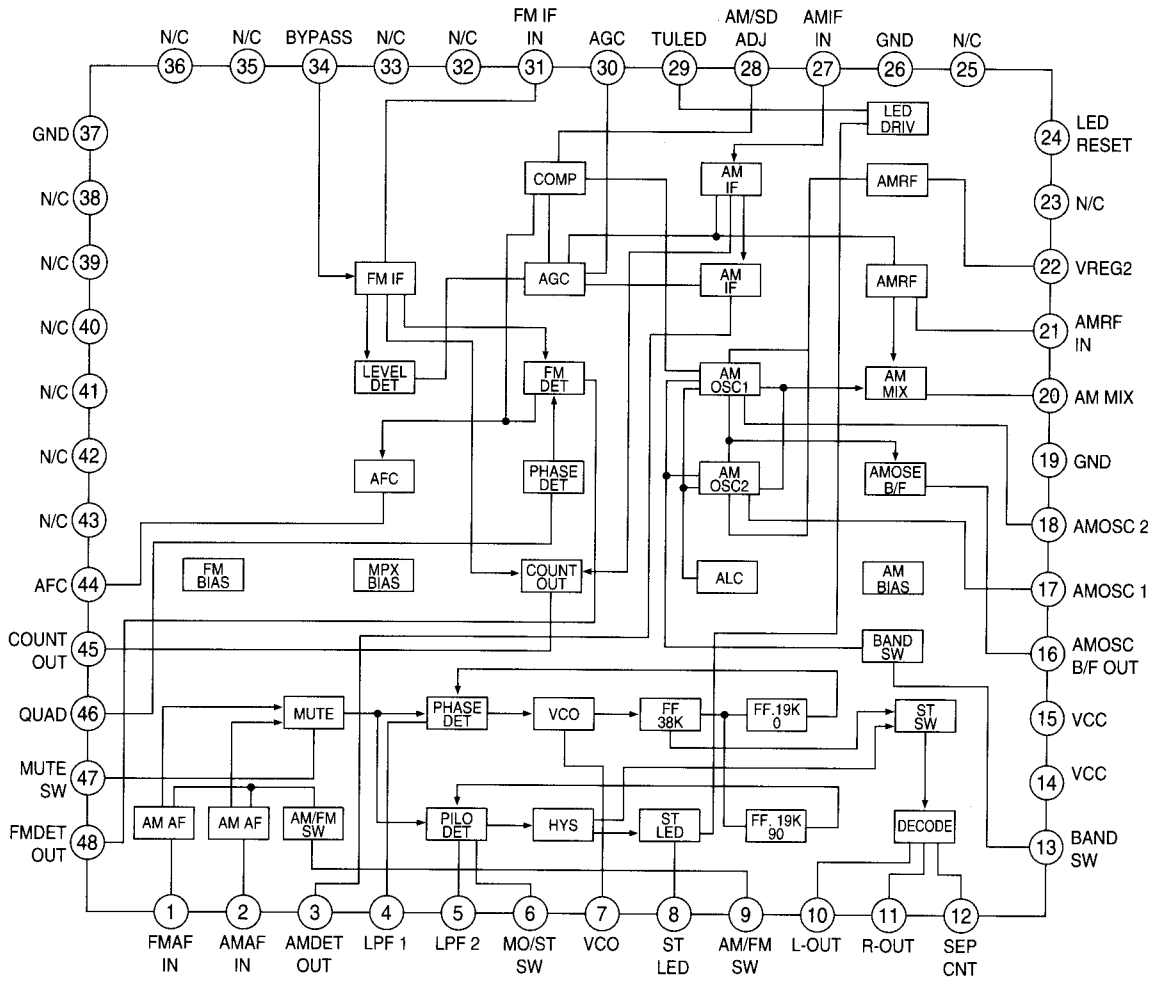
• KA22291: JIC1



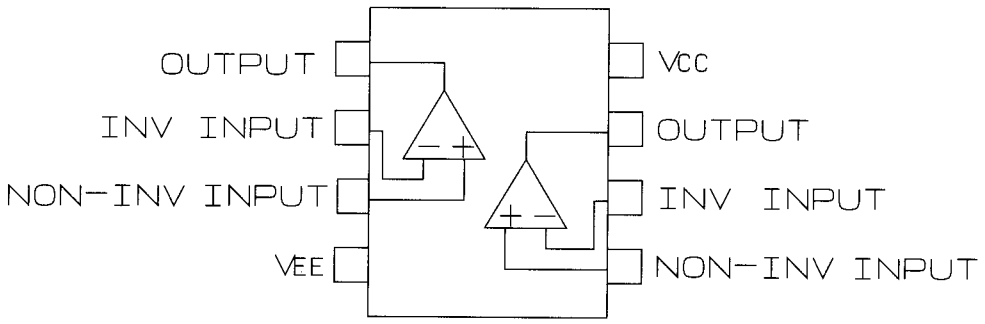
•LM4700 : P-IC/L, P-IC/R



- **KA2295Q : IIC1**

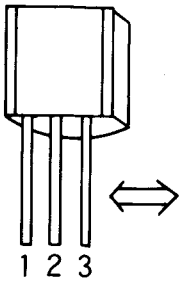


- **BA 4560 : EIC3,FIC2,ZIC3,ZIC2**



14-2. CD section

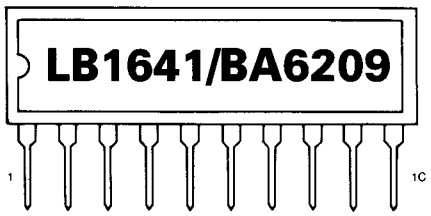
• TR

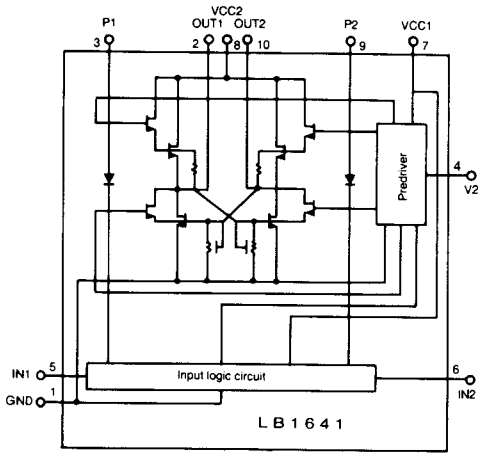


TR	1	2	3
KSR1003 A928	E	C	B

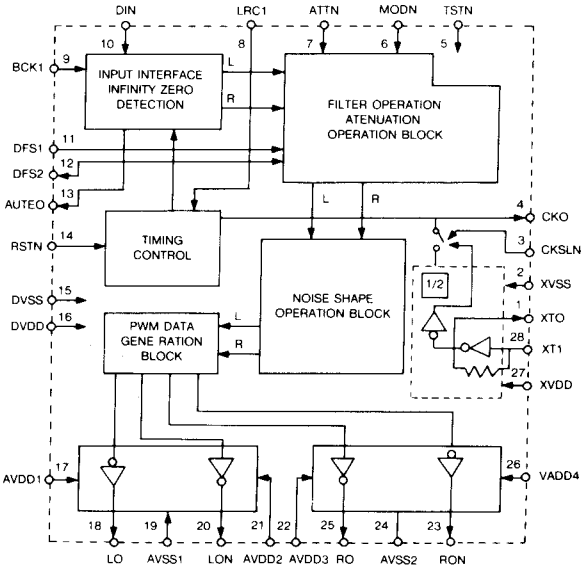
* NOTE : KSB 564 = 'EBC' Type

• LB 1641/BA 6209 (MOTOR DRIVER) : SIC1, SIC2, SIC3, NIC1641

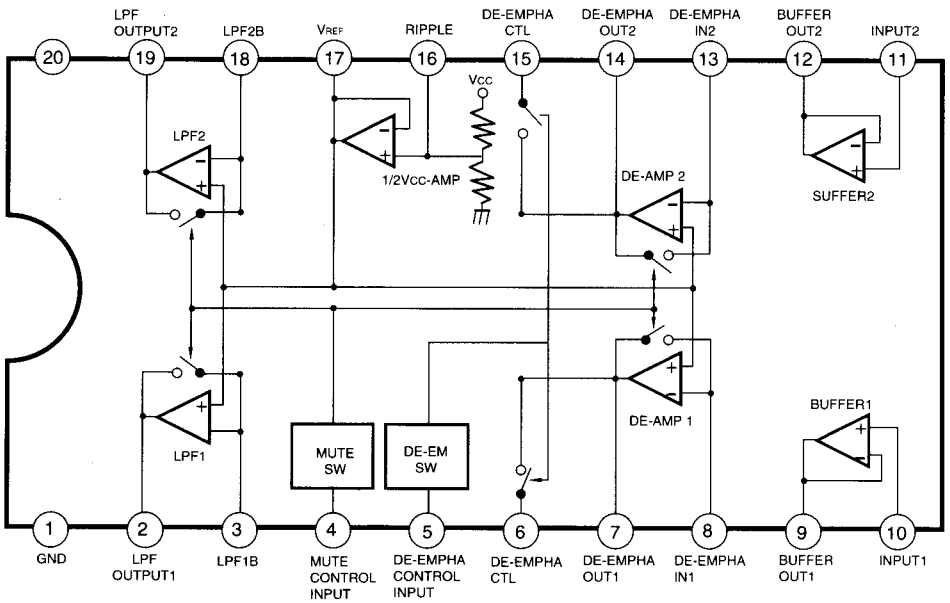




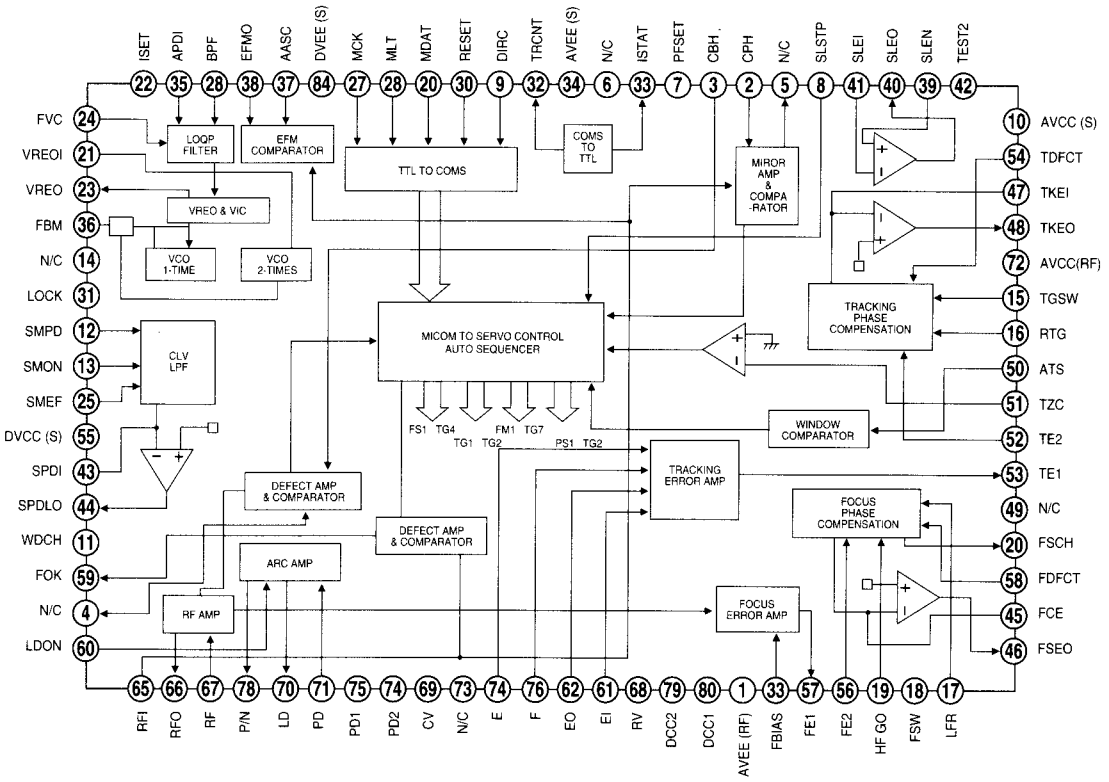
• KA 9270 : NIC9270



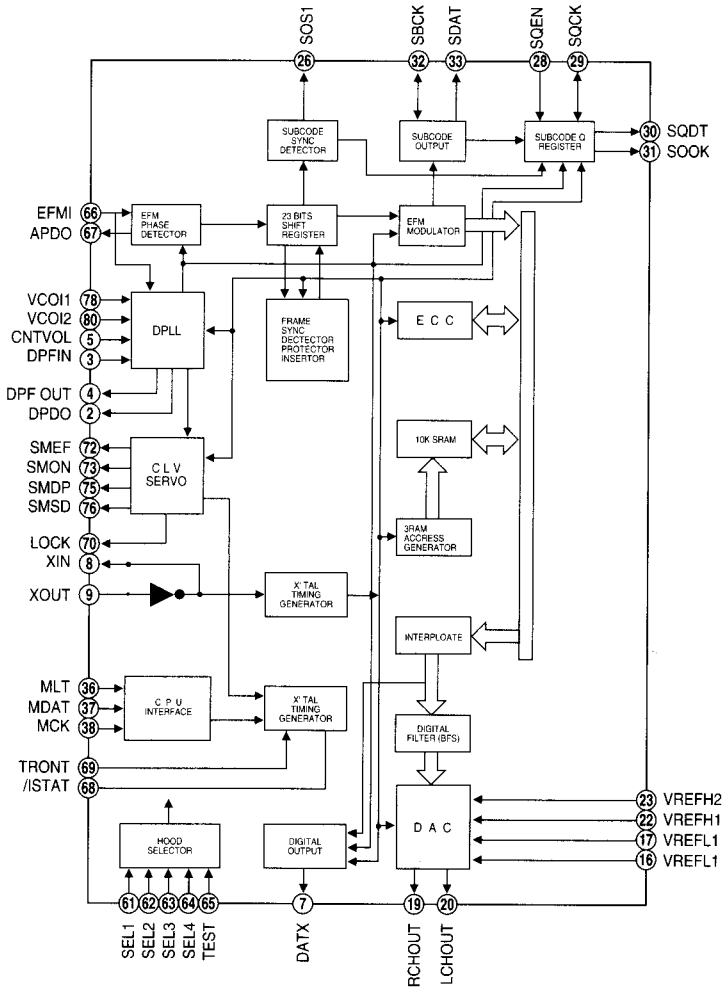
• KA 9258 : NIC9258



• KA9220(ASSP) : NIC9220



• KS9282 (DSP) : NIC9282



15. Electrical parts list

15-1. Main section

Static electricity

⚠ indicates parts for circuit safeguarding purposes. Therefore, when replacing, be sure to use specified parts only.

Location no.	Code no.	Description & Specification	Q'ty	Remark
RR10	11018-277-223	R-CARBON;RD 1/4T 22K-J	1	
MR13	11018-377-100	R-CARBON;RD 0.5T 10-J	1	
HR10	11018-377-101	R-CARBON;RD 0.5T 100-J	1	
RR20,21	11018-377-220	R-CARBON;RD 0.5T 22-J	2	
RR3	11018-377-222	R-CARBON;RD 0.5T 2.2K-J	1	
RR8	11018-377-391	R-CARBON;RD 0.5T 390-J	1	
AR12L,12R	11018-377-479	R-CARBON;RD 0.5T 4.7-J	2	
AR21L,21R	11018-377-561	R-CARBON;RD 0.5T 560-J	2	
RR15	11018-377-681	R-CARBON;RD 0.5T 680-J	1	
LR3	11018-377-820	R-CARBON;RD 0.5T 82-J	1	
RR6	11048-477-152	R-METAL OXIDE;RS1T 1.5K-J MINI TYPE	1	
RR18,26	11048-477-391	R-METAL OXIDE;RS1T 390-J MINI TYPE	2	
RR7	11048-577-221	R-METAL OXIDE;RS2T 220-J MINI TYPE	1	
RR11	11048-577-271	R-METAL OXIDE;RS2T 270-J MINI TYPE	1	
RFR3	11058-477-109	R-FUSIBLE;RF 1T 1-J	1	⚠
J1,2,3,4,5,6	11119-101-000	R-CHIP;SCR2012 PA.P 1/8 O-J	6	
J7,8,9,10,12,13,14,15			8	
J16,18,20,21,22,23,24			7	
J26,27,28,29,30,IC7			6	
IR4	11119-101-100	R-CHIP;MCR10,2012S 10-J	1	
JR38	11119-101-101	R-CHIP;MCR10,2012S 100-J	1	
ZR13L,13R,21L,21R,CR5	11119-101-102	R-CHIP;MCR10,1K-J	6	
FR5L,5R,8L,8R,IR3,JR5,R3			7	
CR3,9,JR22,33,IR2	11119-101-103	R-CHIP;MCR10,2012S 10K-J	5	
HR2,5,6,ZR10L,10R			5	
FR3L,MR9,ER27L,27R			4	
BR3L,3R,CR7,FR4L,4R,OR3	11119-101-104	R-CHIP;MCR10,2012S 100K-J	6	
ZR14L,14R,OR4			3	
LR4,JR1L,1R,MR7	11119-101-123	R-CHIP;SCR2012J123 100CT	4	
MR1,8,15	11119-101-153	R-CHIP;SCR2012J153 100CT	3	
LR5,IR10	11119-101-220	R-CHIP;SCR2012J 220 100CT	2	
HR3,7,OR2-1,MR3,JR24R	11119-101-222	R-CHIP;MCR 10,2012S 2.2K-J	5	
OR6,JR17,27,39,40	11119-101-223	R-CHIP;MCR10,2012S 22K-J	5	
OR6,JR17,27,39,40			5	
JR22L,22R,25,26	11119-101-224	R-CHIP;SCR2012 16V 220K-J	4	
JR12L,12R,IR6	11119-101-272	R-CHIP;MCR10,2012S 2.7K-J	3	
HR1,JR9L,9R,CR15	11119-101-332	R-CHIP;SCR2012S 3.3K-J	4	
AR5L,5R	11119-101-333	R-CHIP;SCR2012J 333 100CT	2	
CR11	11119-101-390	R-CHIP;SCR2012S 39-J	1	
IR12,7,13	11119-101-391	R-CHIP;2012 390J	3	
JR10L,MR14L,14R,ZR16L	11119-101-392	R-CHIP;MCR 102012S 3.9K-J	5	
ZR16R			1	
CR4	11119-101-394	R-CHIP;SCR2012S 390K-J	1	
IR8,9,14,JR4L,4R	11119-101-470	R-CHIP;SCR2012J 470 100CT	5	
FR7L,7R	11119-101-471	R-CHIP;SCR2012 471J	2	

Location no.	Code no.	Description & Specification	Q'ty	Remark
FR2L,6L,6R,RR22,23	11119-101-472	R-CHIP;MCR 10,2012S 4.7K-J	5	
CR2,14			2	
MR11L,11R			2	
FR9L,9R,JR13L,13R	11119-101-473	R-CHIP;MCR 10,2012S 47K-J	4	
JR18	11119-101-474	R-CHIP;SCR2012S 470K-J	1	
AR2L,2R	11119-101-561	R-CHIP;MCR 10,2012S 560-J	2	
LR1L,1R,CR8,6,10	11119-101-562	R-CHIP;MCR 10 2012S 5.6K-J	6	
HR12,HR13,14,FR1L			6	
FR1R,JR30L,30R,MR10			3	
BR2L,2R,AR3L,3R,4L,4R	11119-101-563	R-CHIP;SCR2012 56K-J	6	
JR2L,2R,21	11119-101-682	R-CHIP;SCR2012 682 100CT	3	
CR10	11119-101-683	R-CHIP;SCR2012J 683 100CT	1	
JR14L,14R	11119-101-822	R-CHIP;SCR2012 822 100CT	2	
MR6	11119-102-512	R-CHIP;SCR2012 512F	1	
JR11L,11R	11119-201-820	R-CHIP;SCR2012 1/10W 82-J	2	
FC9L,9R,10L,10R,MC1	11129-001-104	C-CHIP CERAMIC;CC 2012 Y5V 104Z T	5	
JC23,AC9L,9R			3	
AC3L,3R	11129-001-220	C-CHIP CERAMIC;CC2012 COG 220J T	2	
HC3,5,MC9	11129-001-273	C-CHIP CERAMIC;CC 2012 X7R 273K T	3	
JC10,LC3,5,IC8,MC17L	11129-004-103	C-CHIP CERAMIC;CC 2012 X7R 103K T	6	
MC17R			1	
JC1L,1R,2L,2R,3L,3R	11129-004-182	C-CHIP CERAMIC;CC 2012 X7R 182K T	6	
JC5L,5R,11L,11R,MC14L	11129-004-183	C-CHIP CERAMIC;CC 2012 X7R 183K T	6	
MC14R			1	
JC18L,18R	11129-004-222	C-CHIP CERAMIC;CC 2012 X7R 222K T	2	
IC1,3,5,OC1,2	11129-004-223	C-CHIP CERAMIC;CC 2012 X7R 223K T	5	
JC12,MC19			2	
FC11L,11R,ZC10L,10R	11129-004-272	C-CHIP CERAMIC;CC 2012 X7R 272K T	4	
JC13L,13R	11129-004-392	C-CERAMIC CHIP;CC 2012 X7R 392K T	2	
BC1L,1R,FC15L,15R	11129-004-471	C-CHIP CERAMIC;CC 2012 COG 471J T	4	
AC4L,4R			2	
HC1,MC3,17,IC2,9	11129-004-473	C-CHIP,CERAMIC;CC 2012 X7R 473K T	5	
MC10	11129-004-682	C-CHIP CERAMIC;CC 2012 X7R 682K T	1	
JC30L,30R	11129-006-823	C-CHIP CERAMIC;CC 2012 Y5V 823Z T	2	
FTZ4	11129-008-181	C-CHIP CERAMIC;CC 2012 COG 181J T	1	
FC17,18,AC2L,2R	11129-008-221	C-CHIP CERAMIC;CC 2012 COG 221J T	4	
MC13	11129-008-330	C-CHIP CERAMIC;CC 2012 COG 330J T	1	
OC3	11129-009-050	C-CHIP CERAMIC;CC 2012 COG 050J T	1	
JC7L,7R,8L,8R,16L,16R	11129-009-101	C-CHIP CERAMIC;CC 2012 COG 101J T	6	
LC1L,1R,HC11			3	
JC22L,22R	11129-012-472	C-CHIP CERAMIC;CC 2012 X7R 472K T	2	
MR3-1	11249-102-024	VR-SEMI TAPE-H;EVN CYA/EVN-DJAA03 B53	1	
JVR15L	11249-102-034	VR-SEMI TAPE-H;EVN CYA/EVN-DJAA30 B14	1	
MR2-1	11249-102-064	VR-SEMI TAPE-H;EVN CYA/EVN-DJAA30 B54	1	
CVR1	11249-102-104	VR-SEMI TAPE-H;EVN CYA.EVN-DJAA03 B23	1	
HC12	11407-057-200	C-CERAMIC;CC45T CH 50V 20-J	1	
HC13	11407-057-240	C-CERAMIC;CC45T CH50V 24-J TAPE	1	
CC2,5	11417-344-473	C-CERAMIC,HK;CK45T F 50V 0.047M-Z	2	
HC2	11447-910-103	CONDENSER AXIAL-LEAD;16V EP050	1	

Location no.	Code no.	Description & Specification	Q'ty	Remark
HC9,10	11449-518-101	CONDENSER AXIAL-LEAD;50V UP050 B100-K	2	
RC14,15	11469-501-070	C-CERAMIC,AC;DE 7100FZ 472P VA1-KC ALL	2	
LC2	11505-714-102	C-POLYESTER;CQ921T M 50V 0.001M-K	1	
RC1,2	11607-105-222	C-ELECTROLYTIC;MC SMS 35V 2200M(16X31.5)/F	2	
RC3	11607-105-332	C-ELECTROLYTIC;MC SM 35V 3300M(18X35.5)/F	1	
RC12	11607-106-331	C-ELECTROLYTIC;MC SMS 50V 330M(10X20/F	1	
HC8	11608-102-104	C-ELECTROLYTIC;SMS T 10V 100M(5X11)	1	
RC6	11608-102-224	C-ELECTROLYTIC;SMS T 10V 220M(6.3X11)	1	
JC25	11608-102-471	C-ELECTROLYTIC;SMS T 10V 470M(8X11.5)	1	
JC4L,4R,MC2,12,18	11608-103-103	C-ELECTROLYTIC;SMS T 16V 10M(5X11)	5	
LC4,RC4	11608-103-104	C-ELECTROLYTIC;SMS T 16V 100M(6.3X11)	2	
RC7	11608-103-221	C-ELECTROLYTIC;SMS T 16V 220M(8X11.5)	1	
FC5,6,CC1,3,4	11608-103-223	C-ELECTROLYTIC;SMS T 16V 22M(5X11)	5	
RC16,ZC7,8			3	
JC24	11608-103-471	C-ELECTROLYTIC;SMS T 16V 470M(10X12	1	
JC6L,6R,15L,15R,22	11608-103-473	C-ELECTROLYTIC;SMS T 16V 47M(5X11)	5	
RC5			1	
AC6L,6R	11608-104-104	C-ELECTROLYTIC;SMS T 25V 100M(6.3X11)	2	
RC8,17	11608-105-101	C-ELECTROLYTIC;SMS T 35V 100M(8X11.5)	2	
RC11	11608-105-221	C-ELECTROLYTIC;SMS T 35V 220M(10X12.5)	1	
AC1L,1R,MC4,6,8,16	11608-106-102	C-ELECTROLYTIC;SMS T 50V 1M(5X11)	6	
HC7			1	
RC13	11608-106-221	C-ELECTROLYTIC;SMS T 50V 0.22M(5X11)	1	
AC5L,5R,HC4,ZC9L	11608-106-222	C-ELECTROLYTIC;SMS T 50V 2.2M(5X11)	4	
ZC9R,FC1L,1R,2L			4	
FC2R,3L,3R,FC4L,4R,7L			6	
FC7R,8L,8R,14L,14R			5	
JC9L,9R,14L,14R	11608-106-332	C-ELECTROLYTIC;SMS T 50V 3.3M(5X11)	6	
RC9,17L,17R			1	
MC7	11608-106-338	C-ELECTROLYTIC;SMS T 50V 0.33M(5X11)	1	
MC4L,4R,ZC12L,12R	11608-106-472	C-ELECTROLYTIC;SMS T 50V 4.7M(5X11)	4	
BC2L,2R			2	
RIC2	12109-401-730	IC-REGULATORS;MC7808BF,8 5W	1	⚠
HIC1	12119-203-220	IC-FREQ SYNTHESIZER;LM7000	1	⚠
FIC2,ZIC3	12119-401-300	IC-OP AMP;BA4560F-T2	2	
RQ1	12139-103-560	TRANSISTOR;KSA 614-O	1	
RQ7	12139-201-100	TRANSISTOR;KSA928A-Y/KTA1273-Y TAPE	1	
RQ6	12139-301-310	TRANSISTOR;KSC 1009-Y	1	
HQ4,5	12139-601-450	TRANSISTOR;2SK583 TAPE	2	
HQ1,2,3,AQ2,CQ2,5	12149-101-520	TRANSISTOR;KSA733-Y,TAPE	6	
CQ3,RQ2	12149-101-560	TRANSISTOR;KSA708 -Y,TAPE	2	
LQ6	12149-301-840	TRANSISTOR;KSC900-L ,TAPE	1	
IQ1,2	12149-301-860	TRANSISTOR;KSC838-O ,TAPE	2	
AQ1L,1R,FQ1L,1R	12149-301-900	TRANSISTOR;KSC 945-Y,TAPE	4	
JQ1L,1R,CQ4,6,7,8			6	
JQ4,5,8,OQ1			4	
LQ1L,1R,2L,2R,OQ2	12149-301-930	TRANSISTOR;KSC1008-Y,TAPE	5	
RQ3	12149-401-070	TRANSISTOR;KSD73-Y	1	
JQ5,6,7,4,FQ2	12159-301-330	TR-DIGITAL;KSR2003/KRA103M TAPE	5	

Location no.	Code no.	Description & Specification	Q'ty	Remark
JQ2L,2R,3L,3R,9L,9R	12159-301-800	TR-DIGITAL;KSR1007/KRC108M TAPE	6	
RD3,4,5,8,10,11,FD1	12169-201-080	DIODE-RECTIFIER;1N 4001,TAPE	7	
RD2	12169-219-320	DIODE BRIDGE;PBP203 2A 200V	1	
RD1	12169-219-330	DIODE-BRIDG;PBL403	1	
CD1,2,4,7	12169-301-290	DIODE-SW;1SS53/1N4148,CT:6PF	4	
CD9,10,11,12,13,ID1			6	
ID2,PD1,2,RD6,7			5	
JD1,4,5,6			4	
CZD1,RZD6	12169-403-200	DIODE-ZN;RD407E/UZ 4.7BM	2	
RZD2	12169-403-240	DIODE-ZN;1W9.4-10.6V UZP-10B	1	
RZD5	12169-403-890	DIODE-ZN;1W22.8-25.5V UZP-24B	1	
RZD3	12169-403-910	DIODE-ZN;1W11.4-12.6V UZP-12B	1	
RZD4,7,HZD1	12169-404-790	DIODE ZENER;500MW UZ-5.6BSB TAPING	3	
JW33	12429-070-350	COIL-CHOKE;AX 1.2UH-03(LAL03TB1R2M)	1	
JL1R,1L	12429-306-113	COIL-BIAS TRAP;FB895-85A	2	
IFT7	12619-020-067	COIL 7 CAN;AB FM BLU	1	
IFT5	12619-030-005	COIL-CAN;AC 450KHZ YEL	1	
LL1	12619-573-071	COIL-CAN;AG 2.2MH F NON BLK	1	
MWA3	13078-478-125	CONNECTOR-WIRE/B,S;5264-08/5395-08	1	
HJK1	13339-101-600	JACK-HEADPHONE;SOQ5693-01-3010	1	
AUX JACK	13339-544-040	JACK-RCA;ABS & BST2 2P (S-346)	1	
CWA1	13349-103-103	CONNECTOR-WAFER;5267-10A 10P STICK	1	
KWA1	13349-512-562	CONNECTOR-WAFER;5267-04A 4P STICK	1	
JWA1	13349-527-502	CONNECTOR-WAFER;5267-03A 3P STICK	1	
RR7,11,26	13954-500-210	CERAMIC-PIPE;PI1.4 7MM	6	
IFT1,3	14529-301-750	FILTER-CERAMIC;SFE10.7MS3G-A	2	
HX1	14539-501-140	CRYSTAL;HC-49/U 7.2MHZ 12P	1	
IFT6	14539-504-100	CERAMIC RESONATOR;CSB456F15	1	
RIC1,2	15684-507-510	HEAT-SINK,S;AL EXTR WHT 40H,AV330R	2	
MWA4	16439-0204-00	CONNECTOR WIRE-BSS;51004/5295-08 10	1	
P/IC,PCB-H/SINK	17458-230-101	SCREW-TAP TITEBH;2S-3X10FE FZY	4	
RIC1-1,RIC2-1			2	
LW	A1208-0005	TRANS-OSC;RBW07V-K5011 24MM 570/522UH	1	
MW	A1208-0006	TRANS-OSC;RBW07V-K5010 24MM 279/700UH	1	
IFT4	A1243-0049	FILTER-CERAMIC;BP 450+-1.0K ACFMF-450B	1	
SPK TERMINAL	A3059-0017	TERMINAL-BOARD,PUSH;SP-034 4P PCB-TYPE	1	⚠
RIC1	A4008-1205	IC-VOLT REGU;KA7810/KC7810 TO-220 3P BULK	1	⚠
JIC1	A4012-0070	IC-LINEAR;KA22291 DIP PRE/REC AMP	1	⚠
IIC1	A4012-0420	IC-LINEAR;KA2295Q QFP BULK	1	
FM PACK	B1290-0002	TUNER-FM;FE337-A05 3G 75/300OHM	1	
FIC1	B4008-1199	IC-DRIVE;TDA7318 SOP BULK	1	
P-IC/L,P-IC/R	B4012-0446	IC-LINEAR;LM4700TF ZIP-H/S BULK POW	2	
MWA10	B6010-0950	CONNECTOR-WAFER;53434-2411 BLK MOLEX	1	
ANT JACK	A3059-0006	TERMINAL-BOARD,PUSH;SP-030 4P ANT	1	

15-2. Front section

Location no.	Code no.	Description & Specification	Q'ty	Rem.
UC18,19	11407-017-270	C-CERAMIC;CC45T SL 50 27-J	2	
UC11,15,20,21,25,26	11417-344-473	C-CERAMIC,HK;CK45T F 50V 0.047M-Z	6	
UC34,38,39			3	
UC5,8	11448-010-223	CONDENSER AIXAL-LEAD;25V TP 050F2200-Z	2	
UC2,7,27,32,35,40	11449-010-473	CONDENSER AXIAL-LEAD;50V UP F47000-Z	6	
UC41,42			2	
UC28,29,30,31	11449-518-221	CONDENSER AXIAL-LEAD;50V UP050 B220-K	4	
UC4	11608-102-473	C-ELECTROLYTIC;SMS T 10V 47M(5X11)	1	
UC3	11608-104-473	C-ELECTROLYTIC;SMS T 25V 47M(5X11)	1	
UC23,24	11608-105-470	C-ELECTROLYTIC;SMS T 35V 47M(6.3X11)	2	
UC36	11608-106-221	C-ELECTROLYTIC;SMS T 50V 0.22M(5X11)	1	
UC9,22,33	11608-106-222	C-ELECTROLYTIC;SMS T 50V 2.2M(5X11)	3	
UC61,62	11608-106-332	C-ELECTROLYTIC;SMS T 50V 3.3M(5X11)	2	
UC10,13	11608-106-472	C-ELECTROLYTIC;SMS T 50V 4.7M(5X11)	2	
UC14,16,17	11608-152-104	C-ELECTROLYTIC;SRA T 10V 100M(6.3X7)	3	
UIC3	12119-601-770	IC-REGULATOR;MC7805	1	
UQ4	12149-301-900	TRANSISTOR;KSC 945-Y,TAPE	1	
UQ3,5	12159-301-780	TR DIGITAL;KSR1003/KRC103M TAPE	2	
UD5	12169-201-080	DIODE-RECTIFIER;1N 4001,TAPE	1	
UD1,2,3,4,6	12169-301-290	DIODE-SW;1SS53/1N4148,CT:6PF	5	
UD7,8,9			3	
UL1	12429-070-130	COIL-CHOKE;AX 470UH-04	1	
FWA3	13349-512-569	CONNECTOR-WAFER;5267-08A 8P STICK	1	
PSWA1	13359-010-110	SOCKET-AC;HSC0528-01-020	1	
USW1,2,3,4,5,6	13559-901-100	SWITCH-TACT;SKHV10910A	6	
USW7,8,9,10,11,12			6	
USW13,14,15,16,17,18			6	
USW19,20,21,22,23,24			6	
UX1	A1280-0017	CRYSTAL;12MHZ HC-49/U-A 50PPM DV-60OC	1	
VR1	A3012-0018	SW-ROTARY;1C24P 20MM SH EC16B24D0001-ZZZ	1	
ULD1,2,3,4,5,6	A4150-0290	LED-LAMP;SLR34PCN49 GRN T PI2.5	6	
ULD7,8,9,10			4	
FLT1	A4153-0098	V.F.DISPLAY;12ST-166GK MAX440	1	
UC6	B1104-0540	C-ELEC;CE 92 W 5.5V T 473-Z FMOH473Z	1	
R-EYE1	B1294-0043	MODULE-REMOCON;GP1U271R 38KHZ 12NM	1	
UIC1	B4002-0640	IC-MCU;LC866220-5837 MAX-440 QFP BULK	1	
FWA6	B6010-0949	CONNECTOR-WAFER;52690-2411 BLK MOLEX	1	
FWA4	B6010-1549	CONNECTOR-FPC;52492-1620 WHT J/MOLEX	1	
PSC1,2	11469-501-070	C-CERAMIC,AC;DE 7100FZ 472P VA1-KC ALL	2	
FFU3,4	13164-101-913	CLIP-FUSE;PBP 3-1/2H T0.3 SN	2	
FU2	14709-241-160	FUSE;T250V 0.63A	1	⚠
POWER TRANS	A1199-0141	TRANS-POWER;EI66X40 230V 50HZ P	1	⚠
	19159-0063-00	SPK;PS440E MAX440 EXPORT	1	
LOOP ANT	A1261-0006	ANT-LOOP;SJ-015-774 18UH+-20% ROUND	1	
FM T-ANT	A1264-0001	ANT-FM,T;150OHM 3525MM DSFM-008	1	
CDP SIGNAL	A6032-0067	WIRE-PLATE;16/200 BNCD-P=1.25-K-16-190	1	

15-3. CD section

Location no.	Code no.	Description & Specification	Q'ty	Remark
NR555	11058-277-229	R-FUSIBLE;RF 1/4T 2.2-J	1	
NR102,109,205,45L,45R	11119-101-102	R-CHIP;MCR10,1K-J	5	
NR47L,47R,104,203,NRD	11119-101-104	R-CHIP;MCR10,2012S 100K-J	5	
NR42L,42R,114	11119-101-105	R-CHIP;MCR10,2012S 1M-J	3	
NR41L,41R,204,191,100	11119-101-123	R-CHIP;SCR2012J123 100CT	5	
NR190			1	
NR106,107	11119-101-124	R-CHIP;SCR2012 120K-J	2	
NR110	11119-101-153	R-CHIP;SCR2012J153 100CT	1	
NR103,119	11119-101-154	R-CHIP;MCR 10,2012S 150K-J	2	
NR115	11119-101-184	R-CHIP;SCR2012 180K-J	1	
NR101	11119-101-220	R-CHIP;SCR2012J 220 100CT	1	
NR40L,40R	11119-101-223	R-CHIP;MCR10,2012S 22K-J	2	
NR43L,43R,200	11119-101-273	R-CHIP;MCR10,2012S 27K-J	3	
NR201,202	11119-101-332	R-CHIP;SCR2012S 3.3K-J	2	
NR105	11119-101-393	R-CHIP;SCR2012 10V 39K-J	1	
NR117	11119-101-434	R-CHIP;MCR 10,2012S 430K-J	1	
NR44L,44R,46L,46R	11119-101-472	R-CHIP;MCR 10,2012S 4.7K-J	4	
NR111,108	11119-101-473	R-CHIP;MCR 10,2012S 47K-J	2	
NR112	11119-101-563	R-CHIP;SCR2012 56K-J	1	
NR605	11119-101-683	R-CHIP;SCR2012J 683 100CT	1	
NR113	11119-101-822	R-CHIP;SCR2012 822 100CT	1	
NR116	11119-101-824	R-CHIP;SCR2012 824J	1	
NR118	11119-102-820	R-CHIP;SCR2012 1/8 PL,P 82-F	1	
NC204,124	11128-018-474	C-CHIP CERAMIC;GRM40 Y5V 474Z16-530	2	
NC119,120,121,107,108	11129-001-104	C-CHIP CERAMIC;CC 2012 Y5V 104Z T	5	
NC603			1	
NC41L,41R	11129-001-122	C-CHIP CERAMIC;CC2012 X7R 122K T	2	
NC1000,1001	11129-001-151	C-CHIP,CERAMIC;CC2012 COG 151J T	2	
NC118	11129-001-331	C-CHIP CERAMIC;CC 2012 COG 331J T	1	
NC113,125,101	11129-001-333	C-CHIP CERAMIC;CC 2012 X7R 333K T	3	
NC109,104,42R,43L	11129-004-102	C-CHIP CERAMIC;CC 2012 X7R 102K T	4	
NC205,110,116,102,103	11129-004-103	C-CHIP CERAMIC;CC 2012 X7R 103K T	5	
43R,44L,500,600,601,602			6	
NC201	11129-004-152	C-CHIP CERAMIC;CC 2012 X7R 152K T	1	
NC112	11129-004-222	C-CHIP CERAMIC;CC 2012 X7R 222K T	1	
NC200	11129-004-473	C-CHIP,CERAMIC;CC 2012 X7R 473K T	1	
NC111	11129-004-682	C-CHIP CERAMIC;CC 2012 X7R 682K T	1	
NC115	11129-004-683	C-CHIP CERAMIC;CC 2012 Y5V 683Z T	1	
NC190	11129-009-080	C-CHIP CERAMIC;CC 2012 COG 080J T	1	
NC202,203	11129-009-270	C-CHIP CERAMIC;CC 2012 COG 270J T	2	
NC100	11129-012-472	C-CHIP CERAMIC;CC 2012 X7R 472K T	1	
NC45R,46L	11129-019-561	C-CHIP CERAMIC;CC 2012 COG 561J T	2	
NL100	11176-600-040	COIL-CHIP;LQH3C 101K(5)	1	
NVR1702,1703,1704	11249-102-043	VR-SEMI TAPE-V;EVN-DCA A03B24(20K)	3	
NVR1701	11249-102-063	VR-SEMI TAPE-V;EVN-DCA A03B54(50K)	1	

Location no.	Code no.	Description & Specification	Q'ty	REM.
NC703	11608-102-224	C-ELECTROLYTIC;SMS T 10V 220M(6.3X11)	1	
NC114	11608-103-103	C-ELECTROLYTIC;SMS T 16V 10M(5X11)	1	
NC117	11608-106-471	C-ELECTROLYTIC;SMS T 50V 0.47M(5X11)	1	
NC700,701,702,105	11608-152-101	C-ELECTROLYTIC;SRE T 10V 100M(6.3X5)	4	
NC42L	11608-153-470	C-ELECTROLYTIC;SRE T 16V 47M(6.3X5)	1	
NC45L,44R,40L,40R,122	11608-154-479	C-ELECTROLYTIC;SRE T 25V 4.7M(3X5)	5	
	12074-0024-00	SHIELD-PLATE;MM-77 T0.3 SPTE	1	
NIC1641	12119-203-500	IC MOTOR DRIVER;LB1641	1	
NIC05	12119-601-160	IC-REGULATOR;TA78L005/MC 78L05AC	1	
NQ1501	12139-201-100	TRANSISTOR;KSA928A-Y/KTA1273-Y TAPE	1	
NQ1502	12149-202-050	TRANSISTOR;KSB564A-Y	1	
NQ1503	12159-301-780	TR DIGITAL;KSR1003/KRC103M TAPE	1	
ND200,201,202,203	12169-301-290	DIODE-SW;1SS53/1N4148,CT:6PF	4	
NZD101	12169-404-800	DIODE ZENER;500MW UZ-6.2BSB TAPING	1	
NCW104	13349-139-061	CONNECTOR-WAFER;53015-0610 2.0MM	1	
NCW101	13349-139-080	CONNECTOR-WAFER;53015-0810 2.0MM	1	
NS100	13564-601-100	SWITCH-LEAF;MSW-1731CVC	1	
NXF100	14539-503-083	CERAMIC-RESONATOR;CSA 16.93MX040-TF01S	1	
	15104-531-710	SHAFT-CD;FE FZY 2.6X10.5	4	
	16174-503-411	RUBBER-CD;SI RUBBER BLU CMS-M5M6C	4	
	16634-502-610	CABLE-TIE;NYLON 66 08474	1	
	A0102-0076	SCREW-TAP TITE;BH M3 8 SWRH18A ZPC2	2	
NC2000	A1100-0909	C-CERAMIC;CC 73 COG 16V T 040-J C2012	1	
NIC9270	A4012-0089	IC-LINEAR;KA9270D SOP AUDIO FILTER	1	
NIC9258	A4012-0169	IC-LINEAR;KA9258 SOP CD-4CH DRIVER	1	
NIC9220	A4012-0290	IC-LINEAR;KA9220 QFP RF+SSP	1	
NIC9282	A4012-0291	IC-LINEAR;KS9282 QFP DSP+DAC+DPLL	1	
NCW100	A6010-1523	CONNECTOR-WAFER;00-6200-167-012-800	1	
NCW103	A6010-1525	CONNECTOR-WAFER;28-6216-016-100-808	1	
	A6032-0066	WIRE-PLATE;16/90 SFBNCD-P=1.0-K-16-82 WHT	1	

16. List of Abbreviation

ANT	: Antennas
Addr	: Address
ADJ.	: Adjustment
AGC	: Automatic Gain Control
AMP	: Amplifier
ASSY	: Assembly
APC	: Auto power control
BAT	: Battery
BTN	: Button
BAL	: Balance
BLK	: Black
BLU	: Blue
BPF	: Band Pass Filter
BRKT	: Bracket
C	: Chip
CF	: Ceramic Filter
ch	: channel
cm	: centimeter
COM	: Common
CDPS	: Disc Photo Sensor
D	: Diode
D	: Depth
D/A Convertor	: Digital/Analog Convertor
dB	: decibel
DC	: Direct Current
DEC	: Decoder
DET	: Decector
DEV	: Deviation
DSP	: Digital Signal Processor
DTS	: Digiatl Tuning System
DCMT	: Disc Motor
DSCKC	: Disc Lock Sw
EA	: Each
ELPS	: Elevator Photo Sensor
ELLM	: Elevator Limit Sw
ELMT	: Elevator Motor
EQ	: Equalizer
EJ	: Eject
FF	: Fast forward
F/F	: Flip Flop
Fig	: Figure
FREQ.	: Frequency
GND	: Ground
GRN	: Green
GRY	: Gray
H	: Height, High
Hz	: Hertz
IB	: Instruction Booklet
IC	: Integrated Circuit
I/O	: Input/Output
KHz	: Killohertz
Kg	: Killogram
L	: Left, Low
LED	: Light Emiting Diode
LPF	: Low Pass Filter
Max.	: Maximum
MHz	: Megahertz
Min.	: Minimum
MOD	: Modulation
MPX	: Multiplex
MGSW	: Magazine Switch
MGLS	: Magazine Limit Switch
MGLK	: Magazine Limit Switch
NF of NFB	: Negative Feedback
OP AMP	: Operational Amplifier
ORG	: Orange
OSC	: Oscillator
PB	: Playback
PCB	: Printed Circuit Board
PLL	: Phase Lock Loop
P/T	: Power Transformer
R	: Right
RAM	: Random Access Memory
REC	: Record
REG	: Regulator
REW	: Rewind
RF	: Radio Frequency
ROM	: Read Only Memory
R/P	: Record/Play
SP	: Spring
sec.	: Second
SSG	: Standard Signal Generator
SSP	: Servo Signal Processor
ST	: Stereo
ST/EJT	: Stop/Eject
SW	: Switch, Short wave
TP	: Test Point
TR	: Transistor
TRANS	: Transformet
V	: Volt
VIO	: Violet
VCO	: Voltage Controlled Oscillate
VOL	: Volume
Vpp	: Voltage peat or peak
VR	: Volume
Vref	: Reference Voltage
V/SEL	: Voltage selector
VTVM	: Vacuum Tube Volt Meter
VVC	: Voltage Variabel Capacitance
W	: Watt or Weight
WHT	: White
X or X-tal	: Crystal
YEL	: Yellow